

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



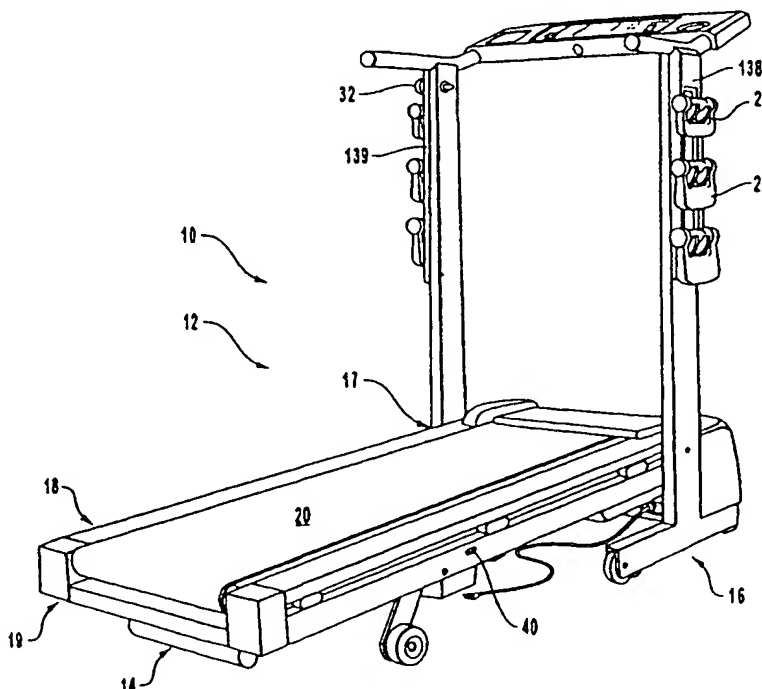
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification⁶ : A63B 21/00</p>	<p>A1</p>	<p>(11) International Publication Number: WO 00/30717 (43) International Publication Date: 2 June 2000 (02.06.00)</p>
<p>(21) International Application Number: PCT/US99/24446 (22) International Filing Date: 18 October 1999 (18.10.99) (30) Priority Data: 09/196,504 20 November 1998 (20.11.98) US (71) Applicant: ICON HEALTH & FITNESS, INC. [US/US]; 1500 South 1000 West, Salt Lake City, UT 84321 (US). (72) Inventors: WATTERSON, Scott, R.; 560 South 1000 East, Logan, UT 84321 (US). DALEBOUT, William, T.; 1770 East 1730 North, Logan, UT 84321 (US). (74) Agents: RICHARDS, Jonathan, W. et al.; Workman, Nydegger & Seeley, 1000 Eagle Gate Tower, 60 East South Temple, Salt Lake City, UT 84111 (US).</p>		<p>(81) Designated States: BR, CA, CN, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i></p>

(54) Title: EXERCISE APPARATUS WITH PIVOTING TREADMILL AND PIVOTING BENCH

(57) Abstract

An exercise apparatus has a frame (16), a tread base (18) pivotally coupled to the frame, and a bench (14) pivotally coupled to the frame. The tread base (18), the bench (14) are each selectively oriented between a substantially vertical storage position, and a substantially horizontal operational position. The bench (14), and the tread base (18) are selectively pivoted independently from one another. Consequently, the bench (14), and the treadmill (12) can be selectively operated simultaneously. Thus, one user can exercise on the bench while another user exercises on the tread base. The bench is selectively operable while the tread base is in the storage position or operational position. Similarly, the tread base is selectively operable while the bench is in the storage or operational position.



BEST AVAILABLE COPY

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

EXERCISE APPARATUS WITH PIVOTING TREADMILL AND PIVOTING BENCH

BACKGROUND OF THE INVENTION

5 1. The Field of the Invention

This invention is in the field of exercise equipment. More specifically, this invention is in the field of treadmills.

2. The Relevant Technology

10 The desire to improve health and enhance cardiovascular efficiency has increased in recent years. This desire has been coupled with the desire to exercise in locations which are compatible with working out within a limited space such as within an individual's home or exercise gym. This trend has led to an increased desire for the production of exercise equipment.

15 However, although a variety of styles of exercise equipment have been produced and are currently on the market, the exercise equipment is often cumbersome and uses a great deal of space. This is particularly frustrating when the exercise equipment is not in use. Thus, attempts have been made to provide exercise equipment which is capable of being collapsed after use.

20 Exercise treadmills typically include an upstanding frame having a first side spaced apart from a second side and a treadbase secured therebetween. The treadbase includes a treadbase frame having a front roller and a rear roller. An endless belt is movably coupled to the treadbase frame, the belt being joined around the front and the rear rollers. The user exercises on the treadmill by walking, jogging or running on the running surface of the endless belt.

25 Reorienting treadmills having a minimal footprint are typically adapted for applications where space is at a premium or the operational appearance is undesirable. Such reorienting treadmills have a treadbase pivotally mounted to the frame. When pivoted to the up or storage position, the treadbase fits within or adjacent the frame. When pivoted to the down or operational position, the treadbase extends outward from
30 the frame to provide a horizontal or inclined surface for running.

In addition to exercise treadmills, a variety of other styles of exercise equipment typically occupy space within an individual's home or gym. It is not uncommon to find homes, for example, in which an entire bedroom or office has been converted into an exercise room. Exercise rooms in homes and gyms often contain several different pieces
35 of exercise equipment. Although these various pieces of equipment increase the number

of different exercises available to the user, each additional piece of equipment takes up more space.

For example, in order to satisfy the interests of weightlifters and exercisers interested in a treadmill workout, typical commercial gyms provide treadmills, weights and weightlifting benches. Furthermore, some home gyms contain both a treadmill, weights and benches. Storing both a weightlifting bench, weights, and a treadmill requires valuable space within a home or commercial gym. Consequently, the user is often limited to a certain number of exercise machines which can be placed within a particular room.

SUMMARY AND OBJECTS OF THE INVENTION

One embodiment of an exercise machine of the present invention comprises: (i) a first exercise apparatus; (ii) a second exercise apparatus; and (iii) means for coupling the second exercise apparatus to the first exercise apparatus. The first exercise apparatus preferably comprises a reorienting or folding treadmill having an upstanding frame and a treadbase coupled to the frame. The treadbase is selectively oriented between a storage position and an operational position. In one embodiment, the second exercise apparatus is coupled to the treadbase and is operable while the treadbase is in the storage position. In another embodiment, the second exercise apparatus is operable while the treadbase is in either the storage or operational position.

One example of the second exercise apparatus coupled to the treadbase is a folding weightlifting bench. Upon ceasing a treadmill workout, it is possible for an exerciser to orient the treadbase into a substantially vertically oriented storage position, fold out the bench, then exercise on the bench. After using the weightlifting bench, the exerciser can fold the weightlifting bench against the treadbase again, then retain the exercise machine in the storage position, or optionally, orient the treadmill into an operational position and exercise on the treadmill again.

One advantage of such an exercise machine is that two or more exercise devices are able to be employed within a single space where previously only one device would fit. Another advantage is that both the running surface of the endless belt of the treadbase and a portion of the treadbase opposite the running surface are capable of being used by the exerciser. The exercise machine may be stored and transported as a single unit rather than requiring the transport and storage of separate devices.

Another feature of the present invention comprises means mounted to the treadmill for removably receiving a free weight. One embodiment of the means for removably receiving a free weight comprises a cradle mounted to the treadmill for removably receiving a handweight, (e.g., a dumbbell), or other free weight.

Thus, the user may use the free weights while simultaneously exercising on the treadmill. Optionally, upon ceasing a treadmill workout, it is possible for an exerciser to orient the treadbase into a substantially vertically oriented storage position, fold out the weightlifting bench, then exercise on the bench using the weights resting on the cradles. Upon ending the free weight workout, the user stores the free weights on the treadmill again, thereby using space efficiently.

As used throughout this specification and the appended claims, the phrase "free weight" refers to a weight which is a discrete entity and is not affixed to another object or mechanism. Examples of free weights include manufactured and non-manufactured objects which can be lifted by a user. One example of a free weight is a hand weight. As used throughout this specification and the appended claims, the phrase "hand weight" refers to any weight having a handle which is grasped by a user. Examples of hand weights include, for example, dumbbells and other weights having handles. Hand weights useful in the present invention may have a variety of different shapes, such as square, rectangle, ball shaped, or a variety of other configurations, so long as the hand weights have a handle which can be grasped by a user.

Yet another embodiment of the invention relates to an exercise machine comprising: (i) a frame; (ii) a treadbase pivotally coupled to the frame; and (iii) a bench pivotally coupled to the frame. The treadbase and bench are each selectively oriented between a storage position and an operational position. The treadbase and the bench are each substantially vertically oriented when in respective storage positions and are also each substantially horizontally oriented when in an operational position.

The bench is pivotally coupled to one end of the frame while the treadbase is pivotally coupled to an opposing end of the frame, such that the bench and the treadbase are selectively pivoted independently from one another. Consequently, the bench and the treadmill can be selectively operated simultaneously. Thus, one user can exercise on the bench while another user exercises on the treadbase.

The bench is selectively operable while the treadbase is in the storage position or operational position. Similarly, the treadbase is selectively operable while the bench is in the storage or operational position. Preferably, the bench is oriented at an angle with respect to a longitudinal axis of the treadbase when the treadbase is in an operational position. This provides space for movement between the bench and the treadbase, permits storage of the bench and treadmill in substantially the same location, and conserves space during operation of both apparatuses.

These and other objects and features of the present invention will become more fully apparent from the following description and appended claims, or may be learned by the practice of the invention as set forth hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

5 In order that the manner in which the above-recited and other advantages and objects of the invention are obtained, a more particular description of the invention briefly described above will be rendered by reference to a specific embodiment thereof which is illustrated in the appended drawings. Understanding that these drawings depict only a typical embodiment of the invention and are not therefore to be considered to be
10 limiting of its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

Figure 1 is a perspective view of an exercise machine of the present invention wherein the treadbase of the machine is shown in an operational position.

15 Figure 2 is a perspective view of the exercise machine of Figure 1 wherein the treadbase is shown in a storage position and a folding bench coupled thereto is also shown in a storage position.

Figure 3 is a perspective view of the exercise machine of Figures 1 and 2 wherein the treadbase is in a storage position and the bench is shown in an operational position. Portions of the exercise machine are shown in a cut-away view.

20 Figure 4 is a view of the framework of the bench of the exercise machine shown in Figure 3, demonstrating a portion of the framework in a lower, operational position and a cut-away portion thereof shown in phantom lines in an upper storage position.

Figure 5 is a view of a series of cradles of the present invention extending from a cradle platform, one cradle removably supporting a hand weight therein.

25 Figure 6 is a view of an alternative cradle of the present invention.

Figure 7 is a cut-away top view of a dual sided latch of the present invention.

Figure 8 is a cut-away frontal view of the dual sided latch shown in Figure 7.

Figure 9 is an exploded perspective view of the dual sided latch and latch track shown in Figures 7 and 8.

30 Figure 10 is a perspective view of an exercise apparatus of the present invention having a pivoting treadbase and pivoting bench, each of which are shown in a substantially horizontal operational position.

Figure 11 is a perspective view of the pivoting treadbase and pivoting bench of Figure 10 with the pivoting treadbase and bench each shown in a substantially vertical
35 storage position.

Figure 12 is a top view of the base of the exercise apparatus shown in Figures 10 and 11.

Figure 13 is a side view of the bench shown in Figures 10 and 11 with various features shown in phantom lines.

5 Figure 14 is a perspective view of yet another embodiment of an exercise apparatus of the present invention having a pivoting treadbase and pivoting bench, each of which are shown in a substantially horizontal operational position.

Figure 15 is a view of the exercise apparatus of Figure 14 wherein the treadbase and bench are each in a storage position. The lat bar of Figure 14 is also removed.

10 Figure 16 is a top view of the means for interconnecting the upstanding members of the exercise apparatus of Figure 14.

Figure 17 is a side view of the bench shown in Figures 14 and 15.

15 Figures 18a and 18b are respective side and top views of a bracket of the exercise apparatus shown in Figures 14 and 15. The bracket is an example of first and second brackets which are employed to pivotally couple a treadbase to the frame of the apparatus.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference now to Figures 1 and 2, an exercise machine 10 of the present invention is disclosed. Exercise machine 10 is comprised of (i) a first exercise apparatus;
20 (ii) a second exercise apparatus; and (iii) means for coupling the second exercise apparatus to the first exercise apparatus. The first exercise apparatus comprises a treadmill, preferably a reorienting treadmill 12. The second exercise apparatus may comprise a variety of different apparatuses, such as a folding weightlifting bench 14 coupled to treadmill 12.

25 Treadmill 12 comprises an upstanding frame 16 and a treadbase 18 pivotally coupled at a pivot end 17 thereof to frame 16. Treadbase 18 is selectively oriented between a substantially horizontally oriented operational position shown in Figure 1 and a substantially vertically oriented storage position, shown in Figure 2. Treadbase 18 comprises a treadbase frame 19 and an endless belt 20 movably coupled to treadbase
30 frame 19. In the embodiment of Figures 1 and 2, bench 14 is coupled to treadbase 18.

Upon ceasing a treadmill workout, it is possible for an exerciser to orient treadbase 18 into the storage position of Figure 2, unfold bench 14 from treadbase 18, then exercise on bench 14. For example, the user may lie on bench 14 and conveniently exercise the upper body using weights 22 resting on means mounted to treadmill 12 for
35 removably receiving a free weight 22, such as a cradle 23. Optionally, the user may use

weights 22 while simultaneously exercising on treadmill 12. conveniently grasping the weights 22 from cradles 23 while exercising.

After using bench 14, the exerciser can fold bench 14 against treadbase 18. then retain exercise machine 10 in the storage position. or optionally, orient treadmill 12 into the operational position, then exercise on treadmill 12 again. Thus, the user is able to efficiently use the space surrounding exercise machine 10 and enjoy the benefits of treadmill 12 as well as bench 14 or other secondary exercise apparatuses.

With continued reference to Figure 2, bench 14 is shown in a substantially vertically oriented bench storage position. Bench 14 is selectively operable while the treadbase is in the storage position. While treadbase 18 is in the storage position, bench 14 is selectively pivoted from the bench storage position shown in Figure 2 to a bench operational position, discussed below.

Upstanding frame 16 of treadmill 12 is comprised of first and second cross members 24, 26 configured to be disposed on a support surface and first and second beams 28, 30 extending upwardly from respective cross members 24 and 26. Frame 16 is only one example of a possible frame for use in the present invention, however. It will be appreciated that treadmill 12 may be configured in a variety of configurations such as the configurations featured in treadmills presently available in the art and others to yet be introduced.

Exercise machine 10 further comprises means for selectively retaining treadmill 12 in a storage position. One embodiment of the means for selectively retaining treadmill 12 in a storage position comprises a spring loaded pin 32 coupled to frame 16 which selectively couples frame 16 to free end 34 of treadbase 18. Free end 34 is opposite pivot end 17 of treadbase 18. Spring loaded pin 32 selectively couples frame 16 to free end 34 by being disposed through apertures in beam 30 and treadbase 18. Thus, treadmill 12 selectively remains in the storage position during use of the second exercise apparatus.

In another embodiment, the means for selectively retaining treadmill 12 in a storage position comprises means for selectively coupling treadbase 18 to one of: (i) the upstanding frame 16 of treadmill 12; and (ii) a free end 36 of the second exercise apparatus, e.g., bench 14.

In the embodiment of Figure 1, the means for selectively coupling treadbase 18 to one of: (i) frame 16; and (ii) a free end 36 of bench 14, comprises a latch 37 movably coupled to treadbase 18. Latch 37 comprises: a handle 38 coupled to a first pin 40 and a second pin 42. Upstanding frame 16 of treadmill 12 has an aperture for receiving first pin 40. Bench 14 has an aperture 44 for receiving second pin 42.

Latch 37 is particularly useful in the embodiment shown because bench 14 is selectively oriented between an operational position and a storage position. When the user desires to retain bench 14 in the storage position, latch 37 is oriented with second pin 42 disposed in aperture 44 of bench 14. When the user desires to release bench 14 into the operational position, the user moves latch 37 toward beam 28 of frame 16, thereby removing second pin 42 from aperture 44.

By moving handle 38 toward beam 28 of frame 16, bench 14 is released, allowing bench 14 to pivot about a pivoting end 50 thereof, which is opposite free end 36. Thus, free end 36 of bench 14 moves outwardly away from treadbase 18. Because of the unique configuration of dual sided latch 37, simultaneously upon releasing bench 14, latch 37 also assists in retaining treadbase 18 in the storage position by coupling the freely movable portion 34 of treadbase 18 to frame 16. Thus, both pin 32 and latch 37 retain treadbase 18 in the storage position while the exerciser exercises on bench 14.

In one embodiment, spring-loaded pin 32 and latch 37 are oriented such that it is only possible to place first latch pin 40 in the corresponding aperture in beam 28 when spring-loaded pin 32 is disposed within treadbase 18. Thus, the user first secures pin 32 into one side of treadbase 18, then releases bench 14 to the operational position and simultaneously retains both sides of free end 34 of treadbase 18 against frame 16.

Also as shown in Figure 2, at least a portion of bench 14 is conveniently placed within a recess 52 within frame 19 of treadbase 18. Recess 52 selectively receives at least a portion of bench 14 or other exercise apparatus, thereby increasing the efficient use of space.

With reference now to Figure 3, bench 14 is shown in a substantially horizontally oriented operational position. As shown, when latch 37 is moved toward beam 28 of frame 16, bench 14 can be readily folded into the operational position.

Figure 3 demonstrates an example of means for coupling bench 14 to treadbase 18. In this embodiment, the means for coupling bench 14 to treadbase 18 shown comprises bench 14 being pivotally coupled at pivot end 50 thereof to frame 19 of treadbase 18. The opposing free end 36 of bench 14 is selectively grasped by the user when the user desires to fold out bench 14 from treadmill 12 or fold bench 14 against treadmill 12.

Also as shown, when bench 14 is in the operational position, bench 14 occupies substantially the same space as that occupied by treadbase 18 when treadbase 18 is in the operational position. This orientation of bench 14 is a significant improvement as an efficient use of space.

Bench 14 may be comprised of a variety of different components. By way of example, in the embodiment of Figure 3, bench 14 comprises a support leg 59 for supporting bench 14 on a support surface.

5 In one embodiment, either (i) raising bench 14 from the operational position to the storage position or (ii) lowering bench 14 from the bench operational position to the bench storage position orients a support leg 59 of bench 14 to a position substantially parallel to the storage position of treadbase 18. As one example of means for selectively orienting support leg 59 into a position substantially parallel to the storage position of treadbase 18 in one of (i) the operational position of the second exercise apparatus; and
10 (ii) the storage position of the second exercise apparatus, bench 14 comprises first and second spaced apart side support beams 53, 54 and an intermediate support beam 55.

At distal ends thereof, intermediate support beam 55 and first and second spaced apart support beams 53, 54 are pivotally coupled to a bracket 56, which is coupled to a support beam 57 of frame 19 of treadbase 18. Support beam 57 is shown as being
15 disposed proximally with respect to endless belt 20 of treadbase 18, yet, at least in the embodiment shown, is disposed distally from a housing 58 of frame 19 of treadbase 18. Optionally, however, bracket 56 or other connector may be coupled directly to a housing 58 of frame 19 of treadbase 18 or to any other position on treadbase frame 19 which allows coupling of bench 14 or another secondary exercise apparatus to
20 treadbase frame 19 without interfering with the movement of endless belt 20. As shown, bench 14 is preferably coupled to a side of frame 19 opposite endless belt 20. At proximal ends thereof, support beams 53, 54 and 55 are pivotally coupled to support leg 59.

With reference to Figures 3 and 4, the distal end of intermediate support beam 55
25 is coupled through the use of a pin to an upper portion of bracket 56 while the distal ends of the first and second spaced apart support beams 53, 54 are pivotally coupled through the use of respective pins to a lower portion of bracket 56. Support leg 59 has opposing side plates 76 at an upper end thereof and a sleeve 97 disposed above the plates. The proximal end of intermediate support beam 55 is pivotally coupled through the use of a
30 pin between the opposing side-plates 76 of support leg 59 while the proximal ends of first and second side support beams 53, 54 are pivotally coupled through the use of a pin to upper sleeve 77 of support leg 59.

Figure 4 demonstrates (i) the distal pivoting axis A of intermediate support beam 55, (ii) the distal pivoting axis B of spaced apart support beams 53, 54, (iii) the
35 proximal pivoting axis C of support beams 53, 54 and the proximal pivoting axis D of intermediate support beam 55. As bench 14 is moved from the lower, operational

position in the direction of arrow 78 toward the upper, storage position, support leg 59 moves from a position substantially parallel to treadbase 18 to another position substantially parallel to treadbase 18. The proximal pivoting axis C' of support beams 53, 54 and the proximal pivoting axis D' of intermediate support beam 55 are shown in the storage position. Only one of the side support beams 54 is shown in the storage, raised position in phantom lines in Figure 4.

Intermediate and side support beams 53, 54, and 55 are thus coupled to treadbase 18 and to support leg 59 such that (i) support leg 59 is substantially parallel to stored treadbase 18 when bench 14 is in the operational position; and (ii) support leg 59 is also substantially parallel to stored treadbase 18 when bench 14 is in the storage position.

It will be appreciated, however, that the function of orienting support leg 59 to a position substantially parallel to stored treadbase 18 in one of the operational and storage positions may be achieved using a variety of different structures such as a two bar linkage or a four bar linkage, for example, which are further examples of means for selectively orienting support leg 59 into a position substantially parallel to the storage position of treadbase 18 in one of (i) the operational position of the second exercise apparatus; and (ii) the storage position of the second exercise apparatus. Examples of such structures, which are the further embodiments of folding benches, are found in U.S. Patent Application Serial No. 09/040,908, which was mentioned previously and is incorporated herein by reference. By coupling the folding benches disclosed in U.S. Patent Application Serial No. 09/040,908 to treadbase 18, these structures comprise additional examples of means for selectively orienting the support leg into a position substantially parallel to the storage position of the treadbase in one of (i) the operational position of the second exercise apparatus; and (ii) the storage position of the second exercise apparatus.

With continued reference to Figures 3 and 4, bench 14 further comprises a tray 60 affixed to first and second spaced apart support beams 53, 54. Tray has an aperture 44 therethrough aligned with an aperture 44 through first support beam 53. A seat 62 is coupled to the proximal ends of first and second support beams 53, 54, and a backrest 63 is pivotally coupled to support beams 53, 54. Backrest 63 comprises a cushion 64 mounted on first and second support members 66, 68 pivotally coupled to support beams 53, 54. Backrest 63 also comprises a crossbeam 70 pivotally coupled to support beams 66, 68 which is selectively oriented against stops 71 located on intermediate support beam 55. Backrest 63 is thereby selectively oriented into a variety of different incline positions. A support plate 74 pivotally coupled to the proximal end of

beams 53, 54 and selectively abutting leg 59 can be employed for added support of leg 59.

Reference will now be made to Figure 5. As mentioned above, cradles 23 are examples of means mounted to treadmill 12 for removably receiving a free weight, such as handweight 22. One cradle 23 is shown as supporting a handle 132 of handweights 22. Handweight 22 also has a hole, through which one cradle 23 is disposed. However, cradles 23 and the other cradles discussed herein can removably and in a stable manner support free weights even if the free weights do not have a hole therethrough. Cradles 23 and the other cradles discussed herein thus support free weights with and without holes therethrough.

In the embodiment of Figure 5, each cradle 23 comprises a bracket having first and second spaced apart fingers 134, 136. Fingers 134, 136 conveniently, removably retain free weights therein. Free weights are also readily removed from fingers 134, 136.

Fingers 134, 136 are spaced apart from each other and are configured to be disposed below at least a portion of the freeweight. Opposing ends of the handle 132 of hand weight 22 are supported by respective fingers 134, 136. Thus, hand weight 22 is cradled stably within fingers 134, 136. Cradles of the present invention can be one pieced, two pieced or can be comprised of three or more pieces.

While cradles 23 or other means for removably receiving free weights can be coupled to treadbase 18, cradles 23 are preferably coupled to upstanding frame 16 so as to be readily available for use during exercise. In the embodiment shown, cradles 23 are mounted to upstanding frame 16 of treadmill by being coupled to first and second cradle platforms 138, 139 (Fig. 1) coupled to respective beams 28, 30 of frame 16.

Cradles 23 are shown in Figure 5 as extending from cradle platform 138. First and second cradle platforms 138, 139 are mounted to respective beams 28, 30 of upstanding frame 16, such as by being bolted, screwed, or welded thereto, or by extending integrally therefrom. Cradle platforms 138 have a recess 140 between fingers 134, 136 which allows a user to place the users fingers therein as the user reaches for a weight. In another embodiment, cradles 23 are mounted directly to frame 16 by extending integrally from respective beams 28, 30 of frame 16, or by being bolted, screwed, or welded thereto, for example.

An alternative cradle 142 for use on treadmill 12 is shown in Figure 6. Cradle 142 comprises first and second lower fingers 144, 146 configured to be spaced at the ends of a free weight handle and a single upper finger 148 configured to be spaced above the middle of the handle to enhance access to the free weight from upper corners and from a lower middle portion, yet still prevent the free weights from bouncing out of cradle 142

during exercise on treadmill 12 or bench 14 or during movement of system 10 to another location.

Other embodiments of a cradle which are useful in the present invention include a tray (such as a tray having slots therein, or a tray having a planar plate and a plurality
5 of walls extending upwardly therefrom), a substantially planar or a shaped plate which does not have walls extending therefrom, a rounded structure, a half pipe shaped structure, a dish-shaped cradle, and a variety of other members which serve to support a free weight above a support surface. A cradle can readily receive a variety of different shapes, such as a rectangular shaped dumbbell, a rounded dumbbell.

10 Additional examples of cradles useful in the present invention for removably coupling weights to frame 16 are disclosed in U.S. Patent Application Serial No. 09/040,908 mentioned previously and incorporated herein by reference. Further examples of means mounted to treadmill 12 for removably receiving a free weight include a single post mounted to frame 16. A weight such as handweight 22 is disposed
15 on the post, the hole through the weight being disposed about the post.

With reference now to Figure 7 (top cutaway view), Figure 8 (front cutaway view), and Figure 9 (exploded view), one embodiment of latch 37 will now be described in additional detail. Latch 37 is disposed substantially within a compartment 80 on one side of frame 19 of treadbase 18. As shown, a substantially S-shaped member 90 couples
20 first and second pins 40, 42 to handle 38. First and second spacers 92, 94 have washers 96, 98, 100 therebetween which ride within slot 102 of latch track 104 coupled to support beam 106 of frame 19 of treadbase 18. Latch 37 is selectively moved back and forth within track 104 into an aperture 108 within upstanding frame 16 and aperture 44 of bench 14.

25 As shown in Figure 8, a spring 110 coupled to latch 37 and latch track 104 is selectively oriented in a first position and a second position. Upon orientation in the first position, as shown in Figure 8, spring 110 locks second pin 42 into bench 14. However, upon movement of handle 38, spring 110 is selectively oriented into a second position (shown in phantom lines) selectively locking first pin 40 into beam 28 of frame 16. The
30 components of latch 37 and latch track 104 are shown in an exploded view in Figure 9.

Other latches which accomplish the purposes of selectively coupling the treadbase to one of (i) frame 16; and (ii) a free end of the second exercise apparatus include: (i) a latch rotatably coupled to treadbase 18 having a freely moving portion which moves toward the second exercise apparatus or frame 16 as desired, (ii) a spring-loaded latch;
35 or (iii) a pin, knob, or other part or mechanism. In another embodiment of a dual side

latch, the pins protrude perpendicularly from a handle, rather than being coupled to a substantially S-shaped member.

Latch 37 serves as an example of means for selectively coupling treadbase 18 to a free end 36 of bench 14. In another embodiment, the means for selectively coupling
5 treadbase 18 to free end 36 comprises a latch which only selectively couples free end 36 of a second exercise apparatus such as bench 14 to treadbase 18 and does not selectively couple treadbase 18 to frame 16.

Although Figures 1 and 2 specifically demonstrate a folding bench as an example of a second exercise apparatus, a variety of other examples of exercise apparatuses may
10 be coupled to the treadbase or to the frame of the treadmill and may be operable while the treadbase is in the storage position (or in the operational position). These apparatuses include exercise devices which are immovably affixed to the treadmill frame or treadbase, apparatuses which are pivotally coupled to the treadmill frame or treadbase, and apparatuses which slide or roll against the treadmill frame or treadbase. Thus,
15 devices may slide on treadbase 18, for example, roll up and down on treadbase 18, may fold out as shown in Figure 3, or may be immovably coupled thereto.

Examples of apparatuses which may be used as second exercise apparatuses by being pivotally, slidably, immovably, or otherwise coupled to a treadmill frame or a treadbase such as treadbase 18 are disclosed in U.S. Patent No. 5,683,331, entitled "Step
20 Exercise Bench with Ratchetting Height Adjustment," issued to Dalebout; U.S. Patent No. 5,622,527, entitled "Independent Action Stepper," issued to Watterson et al.; U.S. Patent No. 5,591,105, entitled "Exercise Step Bench With Adjustable Legs," issued to Dalebout et al.; U.S. Patent No. 4,822,035, entitled "Adjustable Barbell Bar With Rotating Handles," issued to Jennings et al.; U.S. Des. Patent No. 370,949, entitled
25 "Combined Step Bench and Slide Exerciser," issued to Furner; U.S. Des. Patent No. 371,176, entitled "Step Exerciser Bench," issued to Furner; U.S. Patent No. 5,468,205, entitled "Portable Door Mounted Exercise Apparatus," issued to McFall et al.; U.S. Patent No. 4,477,071, entitled "Convertible Rowing Exercising Apparatus," issued to Brown et al.; U.S. Des. Patent No. 326,491, entitled "Stepping Exercise Machine," issued
30 to Dalebout; U.S. Des. Patent No. 286,311, entitled "Rowing Machine," issued to Martinell et al.; U.S. Patent No. 5,149,084, entitled "Exercise Machine With Motivational Display," issued to Dalebout et al.; U.S. Patent No. 5,062,627, entitled "Reciprocator For A Stepper Exercise Machine," issued to Bingham; U.S. Patent No. 5,013,033, entitled "Rowing Apparatus," issued to Watterson et al.; U.S. Patent No. 5,000,442, entitled
35 "Cross Country Ski Exerciser," issued to Dalebout et al.; U.S. Patent No. 4,974,832, entitled "Rower Slant Board," issued to Dalebout; U.S. Patent No. 4,750,736, entitled

"Multipurpose Exercise Machine," issued to Watterson; U.S. Patent No. 5,282,776, entitled "Upper Body Exerciser," issued to Dalebout; U.S. Patent No. 5,190,505, entitled "Stepper Exerciser," issued to Dalebout; U.S. Patent No. 5,058,882, entitled "Stepper Exerciser," issued to Dalebout et al.; U.S. Des. Patent No. 321,388, entitled "Stepping Exercise Machine," issued to Dalebout; U.S. Patent No. 5,000,443, entitled "Striding Exerciser," issued to Dalebout et al.; U.S. Patent No. 4,850,585, entitled "Striding Exerciser," issued to Dalebout; U.S. Patent No. 5,108,093, entitled "Multipurpose Exerciser," issued to Watterson; U.S. Patent No. 4,813,667, entitled "Multipurpose Exerciser," issued to Watterson; U.S. Patent No. 4,796,881, entitled "Multipurpose Exercising Apparatus," issued to Watterson; and U.S. Patent No. 4,921,242 entitled "Exercise Apparatus Resistance System," issued to Watterson, each of which are incorporated herein in their entirety by reference.

Other exercise systems which may function as a second exercise apparatus coupled to the frame of the treadmill or the frame of the treadbase include a line and one or more pulleys, wherein at least one pulley is coupled to the treadbase. In one embodiment, one end the line has a handle thereon while an opposing end of the line from the handle includes means for providing resistance to movement of the line, such as a spring, a shock, or a weight stack disposed within or adjacent the frame of the treadbase. In one embodiment, one pulley and line system is disposed on one side of the treadbase, while another pulley and line system is disposed on another side of the treadbase, thereby enabling the exercising of both arms. A variety of other exercise devices presently available on the market or yet to be designed may also be coupled to a treadbase or the frame of a treadmill as a second exercise apparatus.

While bench 14 is shown in Figures 1 and 2 as being pivotally coupled to treadbase 18, in another embodiment, a treadbase and a bench (or other second exercise apparatus disclosed herein) are each pivotally coupled to a frame and each selectively fold with respect to the frame. In one embodiment, each of the treadbase and bench have a substantially vertically oriented storage position and a substantially horizontally oriented operational position. For example, the bench can be pivotally coupled to one end of the frame while the treadbase is pivotally coupled to an opposing end of the frame, such that the bench and the treadbase are selectively pivoted independently from one another. Thus, the bench may be selectively folded and unfolded while the treadbase is in the operational position and/or the storage position.

Figures 10-13 demonstrate an embodiment of an exercise apparatus comprising: (i) a frame 152; (ii) a treadbase 154 pivotally coupled to frame 152; and (iii) a bench 156 pivotally coupled to frame 152. Treadbase 154 and bench 156 are each

selectively oriented between an operational position, shown in Figure 10 and a storage position, shown in Figure 11. Treadbase 154 and bench 156 are each substantially vertically oriented when in respective storage positions and are each substantially horizontally oriented when in respective operational positions.

5 With continued reference to Figure 10, bench 156 is pivotally coupled to one end 158 of frame 152 while treadbase 154 is pivotally coupled to an opposing end 160 of frame 152, such that bench 156 and treadbase 154 are selectively pivoted independently from one another. Consequently, bench 156 and treadbase 154 can be selectively operated simultaneously. Thus, one user can exercise on bench 156 while another user
10 exercises on treadbase 154.

Bench 156 is selectively operable while treadbase 154 is in the storage position or operational position. Similarly, treadbase 154 is selectively operable while bench 156 is in the storage or operational position.

15 Treadbase 154 may be a variety of different reorienting treadbases which are configured to be pivotally coupled to the frame of a treadmill. Also as shown, treadbase 154 has (i) a treadbase frame 162; and (ii) an endless belt 164 movably coupled to treadbase frame 162.

20 Also as shown in Figure 10, an embodiment of the invention also comprises means for selectively retaining treadbase 154 in a storage position, such as a spring-loaded latch 168 extending from upstanding member 170 of frame 152. As treadbase 154 bypasses latch 168, a spring-loaded knob 172 of latch 168 initially moves in a direction away from treadbase 154, then snaps behind treadbase 154 as treadbase 154 passes, maintaining treadbase 154 in a substantially vertically oriented storage position until knob 172 is compressed by the user and treadbase 154 is again folded into the operational
25 position.

30 Bench 156 comprises a substantially planar frame 174 which is pivotally coupled to frame 152. Bench frame 174 has at least one support leg 176 coupled thereto; and means for selectively orienting support leg 176 into a position substantially parallel to the storage position of treadbase 154 in one of (A) the operational position of bench 156; and (B) the storage position of bench 156.

In the embodiment shown, the means for selectively orienting support leg 176 into a position substantially parallel to the storage position of treadbase 154 in one of (A) the operational position of bench 156; and (B) the storage position of bench 156 comprises leg 176 being pivotally coupled to frame 174 of bench 156.

35 One embodiment of the invention further comprises means for selectively retaining bench 156 in a storage position, such as a plate 180 extending from upstanding

member 182 and a spring-loaded pin 184, shown in Fig. 13 in phantom lines, disposed within pivoting support leg 176. Spring-loaded pin 184 is configured to selectively extend through an aperture 186 in bench 156 into an aperture 187 in plate 180 when bench 156 is in the storage position. Upon rotation of bench 156 to the operational position, pin 184 extends into a second aperture (not shown) in free end 178 of bench 156, selectively retaining bench 156 in the operational position.

With reference now to Figure 11, a handle 188 within pivoting support leg 176 is coupled to spring-loaded pin 184 for selectively compressing spring-loaded pin 184 when the user desires to either lower bench 156 from the storage position to the operational position or vice versa. Upon compressing handle 188, the user can rotate bench 156 up or down.

The frame of the present invention may be configured in a variety of different manners, any of which are designed to permit pivotal coupling of both a bench and a treadbase thereto.

With reference now to Figures 10-12, frame 152 comprises (i) first, second, and third upstanding members 210, 170, 182; and (ii) means for interconnecting the first, second, and third upstanding members. In the embodiment of Figure 12, the means for interconnecting the first, second, and third upstanding members comprises a single base 189 coupled to each of the first, second, and third upstanding members 210, 170, 182.

Base 189 comprises: (i) a first base member 190; (ii) a second base member 192; and (iii) means for coupling first base member 190 to second base member 192. Treadbase 154 is pivotally coupled to upstanding member 210, 170 mounted on first base member 190, while bench 156 is pivotally coupled to upstanding member 182 mounted on second base member 192.

First base member 190 is configured to be mounted on a support surface and, as mentioned, to have first and second upstanding members 210, 170 mounted thereon. First base member 190 may be a base of an existing reorienting treadmill (or a treadmill base yet to be developed), for example. In the embodiment of Figure 12, first base member 190 comprises first and second cross beams 194, 196 configured to be disposed on a support surface and first and second transverse beams 198, 200 between cross beams 194, 196.

The embodiment of second base member 192 shown in Figure 12 is comprised of a cross beam 202 and first, second, and third transverse beams 204, 206 and 208 coupled thereto. However, a variety of different embodiments of a base may be employed, any of which support bench 156 above a support surface. As mentioned, third upstanding member 182 is mounted on second base member 192.

In the embodiment shown in Figure 12, the means for coupling first base member 190 to second base member 192 comprises (i) transverse beam 208 of second base member 192 being configured to be coupled to first base member 190; and (ii) cross beam 196 of first base member 190 being configured to be coupled to second base member 192. In one embodiment, the means for coupling first base member 190 to second base member 192 comprises first and second base members 190, 192 being coupled together, e.g., through welding. Optionally, however, the means for coupling first base member 190 to second base member 192 comprises first and second base members 190, 192 being integrally formed as a single frame component.

Transverse beam 208 has one end thereof configured at an angle so as to mate with cross beam 196 of first base member 190. One end of cross beam 196 is also configured at an angle so as to mate with cross beam 202 of second base member 192.

Consequently, while bench 156 is in the operational position, the longitudinal axis of bench 156 is oriented at an angle with respect to a longitudinal axis of treadbase 154 when treadbase 154 is in an operational position, thereby providing space for movement between bench 156 and treadbase 154. In a preferred embodiment, the longitudinal axis of the operational bench is at about a 45 degree angle with respect to the longitudinal axis of the operational treadbase. However, in another embodiment, the longitudinal axis of the operational bench is oriented 0 to about 270 degrees, more preferably 0 to about 180 degrees, and more preferably 0 to about 90 degrees, with respect to the longitudinal axis of the operational treadbase 154. Thus the bench and the treadbase can be oriented side by side, with the bench behind the treadbase, or in a variety of other relationships.

As shown in Figures 10-11, the angled orientation provides a space for movement of the user between bench 156 and treadbase 154, while nevertheless conserving space during operation of bench 156 and treadbase 154 and providing a compact structure when bench 156 and treadbase 154 are folded into the storage position.

With continued reference to Figures 10 and 11, first and second upstanding members 210, 170 extend upwardly from first base member 190, treadbase 154 being pivotally coupled to upstanding members 170, 210 or, in another embodiment, by being pivotally coupled directly to first base member 190. First base member 190 and upstanding members 210, 170 compose one embodiment of a treadmill frame, treadbase 154 being pivotally coupled thereto, forming one embodiment of a folding treadmill. Folding arm rest 212 which is grasped by the user, is pivotally coupled to upstanding members 210, 170 and folds when treadbase 154 is folded into the storage position.

Second base member 192, upstanding member 182, and bench 156 pivotally coupled thereto compose one embodiment of a folding bench exercise apparatus. The

folding bench apparatus is thus shown in Figures 10-11 as being coupled to a folding treadmill. This also shows one example of a bench 156 being pivotally coupled to a folding treadmill.

5 A cosmetic shield 215 is disposed between upstanding member 170 and upstanding member 182. Frame 152 also comprises a fourth upstanding member 214 extending upwardly from second base member 192 as discussed in greater detail below.

10 With reference now to Figure 13, upstanding member 182 includes a bracket 216, preferably a "T" shaped bracket. First and second support beams 218, 219 (second beam 219 shown in Figure 10) of frame 174 of bench 156 are pivotally coupled to opposing sides of bracket 216, thereby pivotally coupling bench 156 to upstanding member 182. In addition, as shown, a cosmetic member 221 extends between bracket 216 and second base 192 while another cosmetic member 217 extends above plate 180 from upstanding member 182.

15 The invention further comprises means mounted to frame 152 for removably receiving a free weight. The means for receiving a free weight can be movably or affixedly coupled to frame 152. For example, as shown in Figure 13, in a preferred embodiment, the invention further comprises (i) means movably mounted to frame 152 for removably receiving a free weight, such as a hand weight 219; and (ii) means for enabling a user to selectively move the means for removably receiving the free weight
20 between a neutral position and a raised position.

One version of the means movably mounted to frame 152 for removably receiving the free weight comprises a carriage 220 movably coupled to frame 152, carriage 220 including upper and lower cradles 222, 224 for removably receiving the free weight. Cradles 222, 224 are coupled to a hollow rectangular tube-shaped sliding member 225
25 having end caps in opposing ends thereof. The end caps have apertures therein for receiving rods 228, 230 such that carriage slides up and down on rods 228, 230. The means for enabling a user to selectively move carriage 220 between a neutral position and a raised position shown in Figure 13 comprises a pulley and cable system 226 coupled to frame 152 and carriage 220.

30 Upstanding members 182, 214 are spaced apart U-shaped members such that carriage 220 rides up and down on rods 228, 230 mounted within members 182, 214. Carriage 220 and pulley and cable system 194 may be configured similar or identical to systems described in the patent application entitled "Exercise Machine for Lifting Removable Free Weights, to Watterson," et al, Serial No. 09/040,908, which is
35 incorporated herein in its entirety by reference.

An exercise station, such as a handle 232 or leg cuff 234 is coupled to the pulley and cable system 226, enabling a user to selectively move carriage 220 between the neutral position and the raised position by selectively extending and releasing handle 232 or leg cuff 234.

5 In yet another embodiment, rather than being coupled to carriage 220, pulley and cable system 226 is coupled to means for providing resistance to movement of the cable, such as a spring, a shock, or a weight stack disposed within or adjacent members 182, 214. In one embodiment, the weight stack rides along rods 228, 230, the weights having apertures through which members 228, 230 extend. In one such embodiment, cradles or
10 other means for removably receiving a free weight, are coupled to the top weight, such that the user can select to lift the top weight and the cradles with or without a free weight therein and such that the user can selectively lift additional, lower weights by placing a pull pin below the lower weights.

With reference now to Figure 14, yet another embodiment of an exercise
15 apparatus 300 comprises a frame 302; (ii) a treadbase 304 pivotally coupled to frame 302; and (iii) a bench 306 pivotally coupled to frame 302. Treadbase 304 and bench 306 are each selectively oriented between an operational position, shown in Figure 14 and a storage position, shown in Figure 15. Treadbase 304 and bench 306 are each substantially vertically oriented when in respective storage positions and are each
20 substantially horizontally oriented when in respective operational positions.

In the embodiment of Figure 14, frame 302 comprises (i) first, second, and third upstanding members, 342, 344, 346; and (ii) means 340 for interconnecting first, second, and third upstanding members 342, 344, 346.

Bench 306 comprises an L-shaped frame member 348, a back rest 334 pivotally
25 coupled to L-shaped frame member 348, a seat 336 coupled to frame member, and a leg extension mechanism 338 coupled to frame member 348. In order to pivotally couple bench 306 to frame 302, a pivot beam 352 is affixed to upstanding members 344 and 346 and bench 306 pivots thereon. In another embodiment, a pivot beam is affixed to L-shaped frame member 348, and pivots within upstanding members 344, 346 of frame
30 302.

As an example of means for selectively retaining bench 306 in a storage position, exercise apparatus 300 further comprises a locking beam 354. Locking beam 354 may be employed to selectively lock bench 306 in the storage position when beam 354 is disposed through L-shaped frame member 348 and through respective lower apertures
35 in second and third members 344, 346. Beam 354 may also be employed to selectively maintain back rest 334 in a raised position when beam 354 is disposed through upper

apertures 356 in upstanding members 344 and 346. However, in the view shown in Figure 14, locking beam 354 is positioned within respective lower apertures in second and third members 344, 346 in order to store locking beam 354 for future use.

5 Treadbase 304 is pivotally coupled to frame 340 by being pivotally coupled to upstanding members 342 and 344.

The invention further comprises means for removably receiving a free weight, the means being movably or affixedly coupled to frame 302. The embodiment of Figure 14 demonstrates one example of first and second means coupled to frame 302 for removably receiving a free weight, wherein at least one of the first and second means for
10 removably receiving a free weight is selectively affixed to frame 302.

For example, carriage 308 coupled to upstanding member 346 is one example of first means for removably receiving a free weight, the first means being selectively affixed to frame 302. Cradle 318 coupled to second upstanding member 344 is an example of second means coupled to frame 302 for removably receiving a free weight.
15 One or more free weights may be removably received by carriage and/or cradle 318.

Carriage 308 comprises a sleeve 312 movably coupled to frame 302 and at least one cradle 314 and/or post 324 coupled to sleeve 312. Sleeve 312 is movably coupled to frame 302, selectively sliding upwardly and downwardly along frame 302. Sleeve 312 slides upwardly along upstanding member 346 when lat bar 326 or other exercise station
20 is actuated, e.g., by being pulled. In order to selectively affix sleeve 312 to frame, in one embodiment, a pull pin 332 (a tip portion 332 of which is shown in Figure 14 extending through sleeve 312) is placed through corresponding apertures in sleeve 312 and upstanding member 346. In one embodiment, the pull pin is a springloaded pin coupled to sleeve 312.

25 Sleeve 312 preferably has first and second cradles 314, 316 coupled thereto on one side and a post 324 coupled thereto on an opposing side. Cradles 314, 316 can be employed to removably receive a free weight such as a hand weight, and post 324 can be employed to removably receive a free weight having a hole therethrough. Thus, upon releasing pull pin 332 from sleeve 312 it is possible to engage in exercises by placing a
30 weight on post 324 or cradle 314 or 316 of sleeve 312, then pulling lat bar 326. Optionally, a dumbbell or other weight can be removably received by sleeve 312 within cradle 314 or 316 or post 324 while sleeve 312 is affixed to frame 302. One or more bushings may be disposed within sleeve 312 to reduce sliding friction.

35 If desired by the exerciser, sleeve 312 is affixed to upstanding member 346 and cradles 314 or 316 are employed to removably receive a weight such as one end of a barbell, the other end of the barbell being held by second means for removably receiving

a free weight, such as at least one of cradles 318 or 320 coupled to upstanding member.

Thus, a user can readily perform exercises by performing a military press or other exercise employing a barbell or other free weight removably coupled between cradles 314 and 318 on opposing upstanding members or between cradles 316 and 320. Cradles 318, 320 on second upstanding member 344 may be selectively or permanently affixed to upstanding member 344.

A user can thus jog, run, or walk on treadbase 304, and can optionally rest a free weight such as a dumbbell on one of cradles 314, 316, 318 or 320 or on post 324 while performing such exercises, then selectively remove such weight while exercising or afterwards. The same or a different exerciser can exercise on bench performing leg lifts, military presses, lat pull downs, dumbbell exercises or a veritable cornucopia of other exercises.

The various exercises available on apparatus 300 are thus a significant advantage of the present invention. In addition, apparatus 300 is compact and uses space for engaging in such a variety of exercises in a highly efficient manner.

Carriage 308 is thus an example of means movably mounted to frame 302 for selectively receiving a free weight, while pulley and cable system 310 coupled to frame 302 and carriage 308 is an example of means for enabling a user to selectively move the means for removably receiving the free weight between a neutral position and a raised position.

With reference now to Figure 15, bench 306 and treadbase 304 are each shown in an upstanding storage position. As shown, beam 354 is employed to selectively retain bench 306 in the storage position. Beam 354 has a hook 360 coupled thereto. Hook 360 assists in maintaining beam 358 within upstanding member 346 and upstanding member 344 until the user desires to move beam 354, therefrom. Upon so desiring, the practitioner rotates beam 354, thereby moving hook 360 upwardly away from upstanding member 346 and thereby allowing the user to pull beam 354 out of upstanding members 344 and 346.

Elongated brackets 364, 366 are coupled to backrest 334 and, at one end pivotally couple to L-shaped frame member 348. Upper aperture 356 is also shown in Figure 15, through which locking bar 354 is placed when the exerciser desires to orient backrest 334 in a raised position. Also as shown in Figure 15, in one embodiment, treadbase 304 is pivotally coupled to brackets 372, 374 mounted on respective opposing upstanding members 342 and 344, thereby pivotally coupling treadbase to members 342 and 344.

Figure 16 demonstrates one example of means for interconnecting first, second, and third upstanding members 342, 344, 346. As opposed to the single base disclosed

above in Figure 12, in the embodiment shown in Figure 16, the means for interconnecting members 342, 344, 346 comprises two separate interconnecting members 376, 380. First interconnecting member 376 is a T-shaped member having upright member 342 coupled onto the top thereof. Second interconnecting member 380 is an L-shaped member positioned between second and third upright members 344 and 346, as shown. In addition, third member 382 is coupled to third upright member 346 for added support.

Brackets 372 and 374 are also shown from the top view in Figure 16. Brackets 372 and 374, are each curved on ends thereof in order to be held tightly against respective upstanding members 342 and 344.

First interconnecting member 376 and first and second upstanding members 342, 344 compose one embodiment of a treadmill frame, treadbase 304 being pivotally coupled thereto, forming one embodiment of a folding treadmill. As shown herein, a variety of examples of means for pivotally coupling a bench to the frame of a treadmill exist. For example, the bench may be pivotally coupled to the frame of the treadmill by being pivotally coupled to a third upstanding member coupled to the frame of the treadmill (see Figures 10 and 11), by being pivotally coupled directly to a first or second upstanding member 342 or 344 or other portion of a treadmill frame, or by being pivotally coupled between the treadmill frame and an upstanding member 346 coupled to the treadmill frame (see Figures 14 and 15), or in a variety of other manners.

Referring now to Figure 17, a side view of bench 306 is shown. Upon coupling beam 354 to within an upper aperture of second and third members 342, 344, back rest 334 is readily placed in an upper position and maintained in said position. Lower aperture 384 is also shown in Figure 17 in which beam 354 can be placed for storage of beam 354 or to selectively retain bench 306 in a storage position when beam 354 is disposed through lower apertures 384 in second and third members and through aperture 365 in L-shaped frame member 348.

Pulley and cord system 310 comprises pulleys 328, 330 coupled to third upstanding member 346. Also as shown, a bracket 386 couples a cord 388 of system 310 to sleeve 312. A knob of pull pin 332 is also shown. Side and top views of examples of brackets 372 for coupling treadbase 304 to upright members 342 and 344 are shown in Figure 18A and 18B.

In light of the various exercise stations on apparatus 300, a variety of different exercises may be performed on apparatus 300, including, without limitation, leg extension exercises, military press exercises, lat pull down exercises, jogging, running, walking, weight lifting with handweights, and a variety of different exercises. Fortunately, each of these exercises may be employed using a single machine in which

efficient use of space is at a premium.

5 The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed is:

1. An exercise apparatus, comprising:
 - (a) a frame;
 - (b) a treadbase pivotally coupled to the frame; and
 - 5 (c) a bench pivotally coupled to the frame.
2. An exercise apparatus as recited in Claim 1, wherein the frame comprises:
 - (i) first, second, and third upstanding members; and
 - (ii) means for interconnecting the first, second, and third upstanding members.
3. An exercise apparatus as recited in Claim 2, wherein the means for
10 interconnecting the first, second, and third upstanding members comprises a base coupled to each of the first, second, and third upstanding members.
4. An exercise apparatus as recited in Claim 2, wherein the means for interconnecting the first, second, and third upstanding members comprises a first member coupled between the first and second upstanding members and a second member coupled
15 between the second and third upstanding members.
5. An exercise apparatus as recited in Claim 2, wherein the treadbase is pivotally coupled between the first and second upstanding members.
6. An exercise apparatus as recited in Claim 5, wherein the bench is pivotally coupled to at least one of the second and third upstanding members.
- 20 7. An exercise apparatus as recited in Claim 5, wherein the bench is pivotally coupled between the second and third upstanding members.
8. An exercise apparatus as recited in Claim 1, further comprising:
means movably mounted to the frame for removably receiving a free weight; and
means for enabling a user to selectively move the means for removably receiving
25 the free weight between a neutral position and a raised position.
9. An exercise apparatus as recited in Claim 8, wherein the means movably mounted to the frame for removably receiving the free weight comprises a carriage movably coupled to the frame, the carriage including a cradle for removably receiving the free weight.
- 30 10. An exercise apparatus as recited in Claim 1, wherein the treadbase is selectively oriented between a storage position and an operational position, and wherein the bench is selectively operable while the treadbase is in the storage position or operational position and wherein the treadbase is selectively operable while the bench is in the storage position or operational position.
- 35 11. An exercise apparatus as recited in Claim 1, further comprising means for selectively retaining the bench in a storage position.

12. An exercise apparatus as recited in Claim 1, wherein the bench comprises:
(i) a support leg for supporting the bench on a support surface; and
(ii) means for selectively orienting the support leg into a position substantially parallel to the storage position of the treadbase in one of: (A) the operational position of the bench; and (B) the storage position of the bench.
13. An exercise apparatus as recited in Claim 1, wherein the treadbase has (i) a treadbase frame; and (ii) an endless belt movably coupled to the treadbase frame.
14. An exercise apparatus as recited in Claim 1, wherein the bench is pivotally coupled to one end of the frame while the treadbase is pivotally coupled to an opposing end of the frame, such that the bench and the treadbase are selectively pivoted independently from one another.
15. An exercise apparatus as recited in Claim 1, further comprising first and second means coupled to the frame for removably receiving a free weight, wherein at least one of the first and second means for removably receiving a free weight is selectively affixed to the frame.
16. An exercise apparatus as recited in Claim 15, wherein the first means for removably receiving a free weight comprises a carriage selectively affixed to the frame.
17. An exercise apparatus as recited in Claim 16, wherein the carriage comprises a sleeve slidably coupled to the frame, the sleeve being configured to be selectively affixed to the frame.
18. An exercise apparatus as recited in Claim 16, wherein the second means for removably receiving a free weight comprises a cradle affixed to the frame.
19. An exercise apparatus as recited in Claim 1, further comprising a cradle mounted to the frame for removably receiving a free weight.
20. An exercise apparatus, comprising:
(a) a frame;
(b) a treadbase pivotally coupled to the frame; the treadbase having: (i) a treadbase frame, and (ii) an endless belt movably coupled to the treadbase frame, the treadbase selectively oriented between a storage position and an operational position; and
(c) a bench pivotally coupled to the frame, the bench selectively oriented between a storage position and an operational position, wherein the treadbase is pivotally coupled to one end of the frame while the bench is pivotally coupled to an opposing end of the frame such that the treadbase and bench are selectively pivoted independently from one another.

21. An exercise apparatus as recited in Claim 20, wherein the longitudinal axis of the bench is oriented at an angle with respect to a longitudinal axis of the treadbase when the treadbase is in an operational position.

5 22. An exercise apparatus as recited in Claim 21, wherein the longitudinal axis of the bench is oriented 0 degrees to about 90 degrees with respect to the longitudinal axis of the treadbase when the treadbase and bench are in an operational position.

23. An exercise apparatus, comprising:

(a) a treadmill, comprising:

- 10 i. a frame; and
ii. a treadbase pivotally coupled to the frame; the treadbase having:
(i) a treadbase frame, and (ii) an endless belt movably coupled to the treadbase frame, the treadbase selectively oriented between a storage position and an operational position;

(b) a bench; and

15 (c) means for pivotally coupling the bench to the frame of the treadmill such that the bench is selectively oriented between a storage position and an operational position.

24. An exercise apparatus as recited in Claim 23, wherein the means for pivotally coupling the bench to the frame of the treadmill such that the bench is
20 selectively oriented between a storage position and an operational position comprises the bench being pivotally coupled to the frame of the treadmill.

25. An exercise apparatus as recited in Claim 23, wherein the means for pivotally coupling the bench to the frame of the treadmill such that the bench is selectively oriented between a storage position and an operational position comprises an
25 upstanding member coupled to the treadmill frame, the bench being pivotally coupled between the upstanding member and the treadmill frame.

26. An exercise apparatus as recited in Claim 23, wherein the means for pivotally coupling the bench to the frame of the treadmill such that the bench is selectively oriented between a storage position and an operational position comprises an
30 upstanding member coupled to the treadmill frame, the bench being pivotally coupled to the upstanding member.

1 / 16

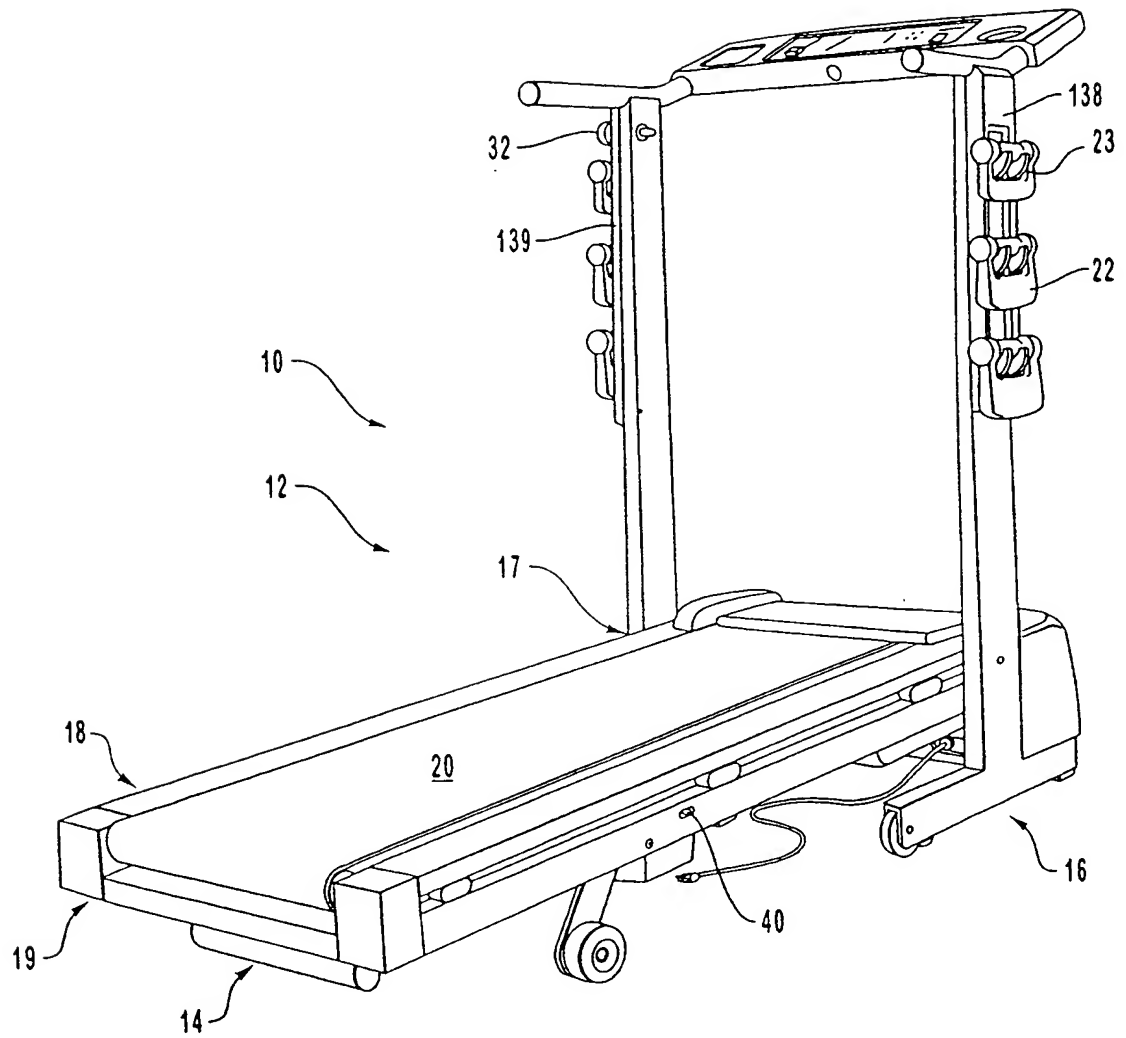


FIG. 1

2 / 16

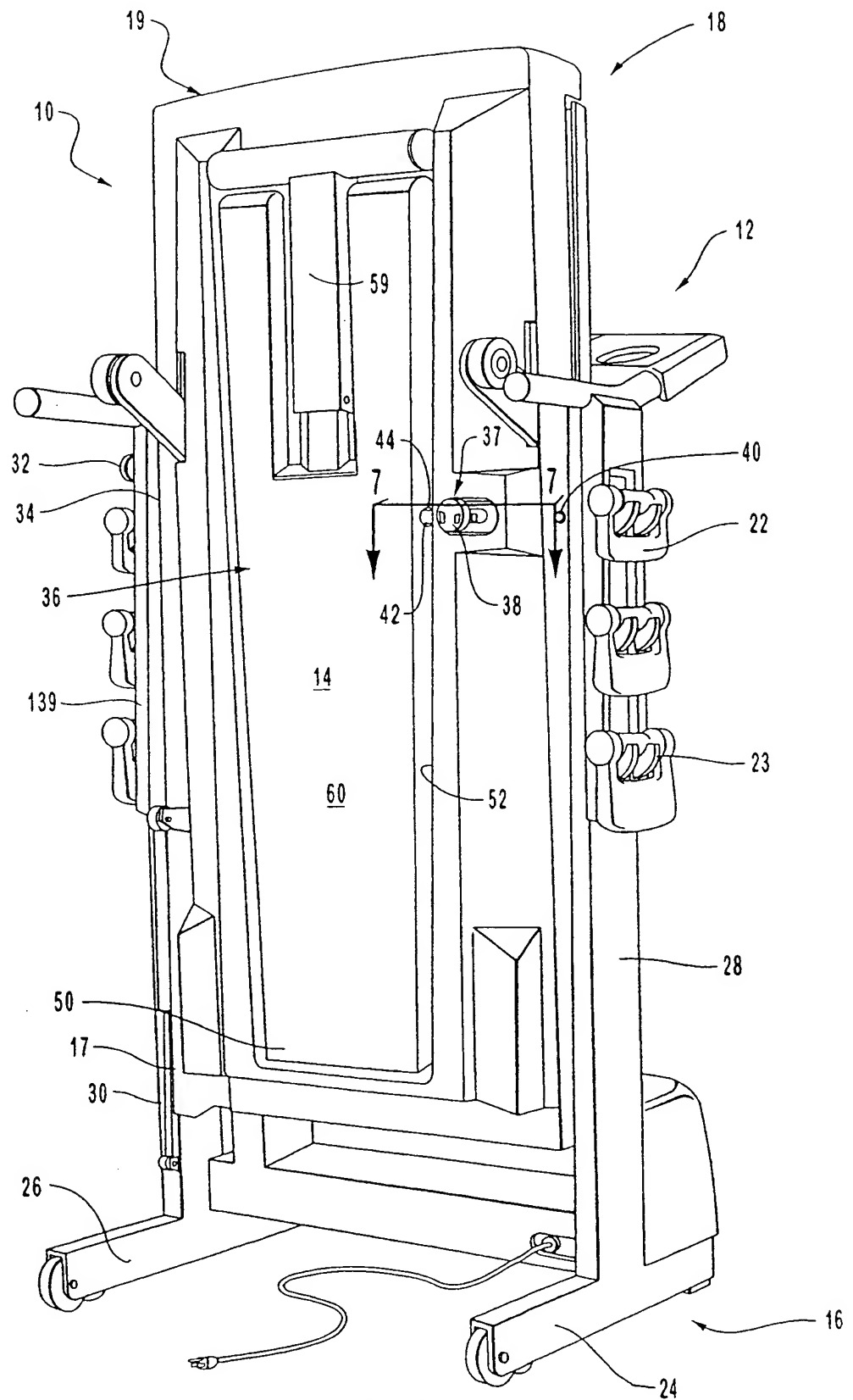


FIG. 2

3 / 16

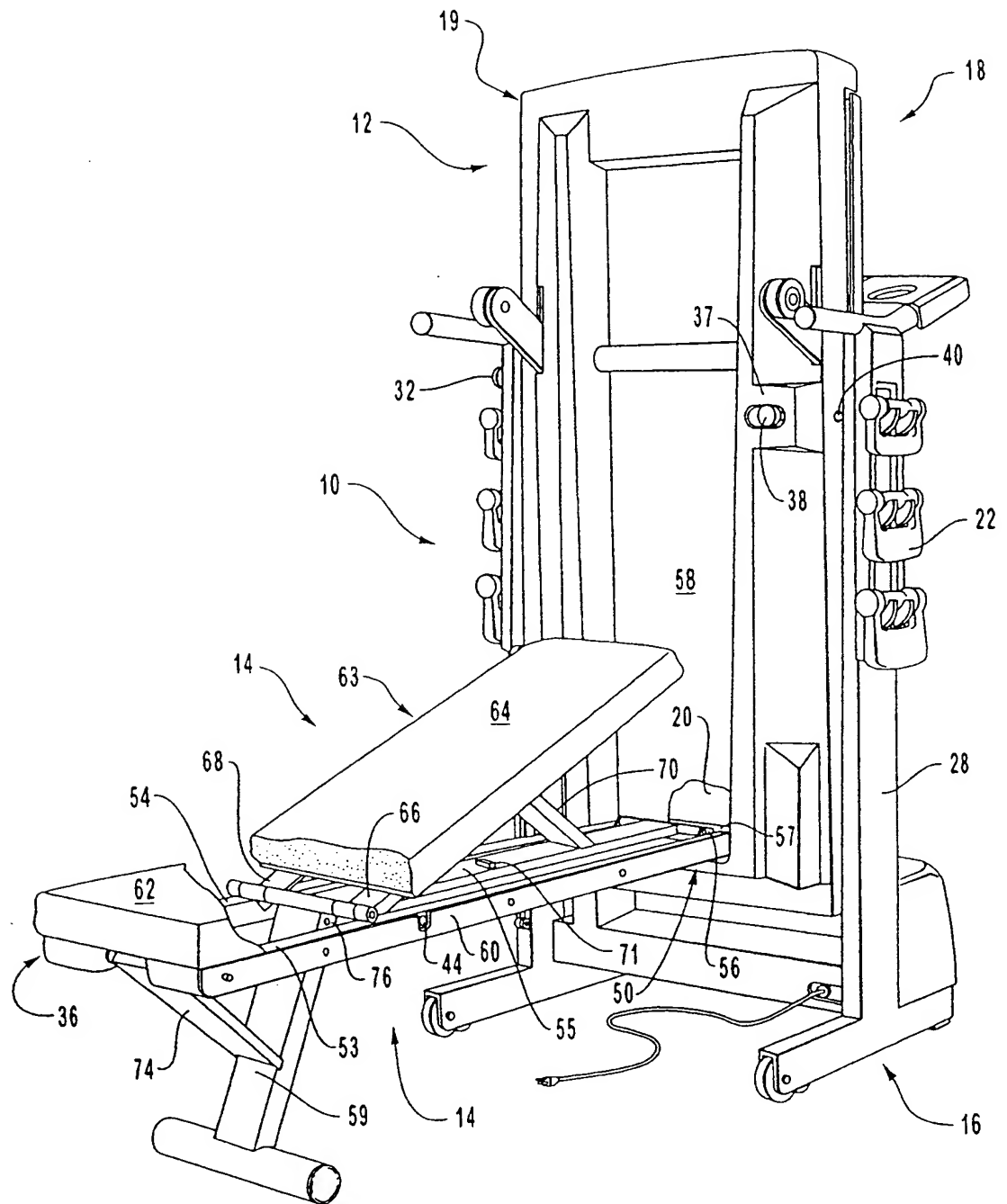
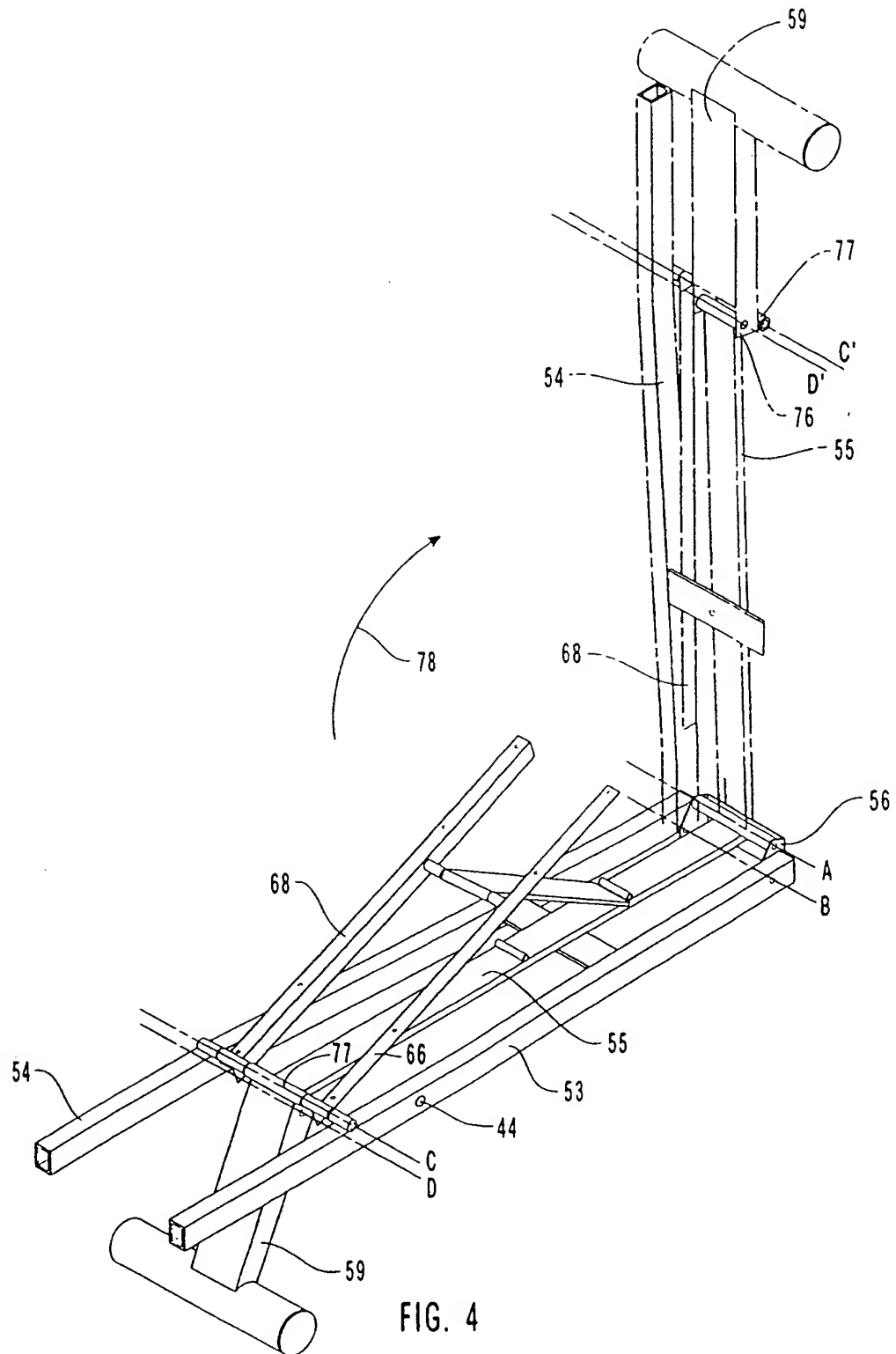


FIG. 3

4 / 16



5 / 16

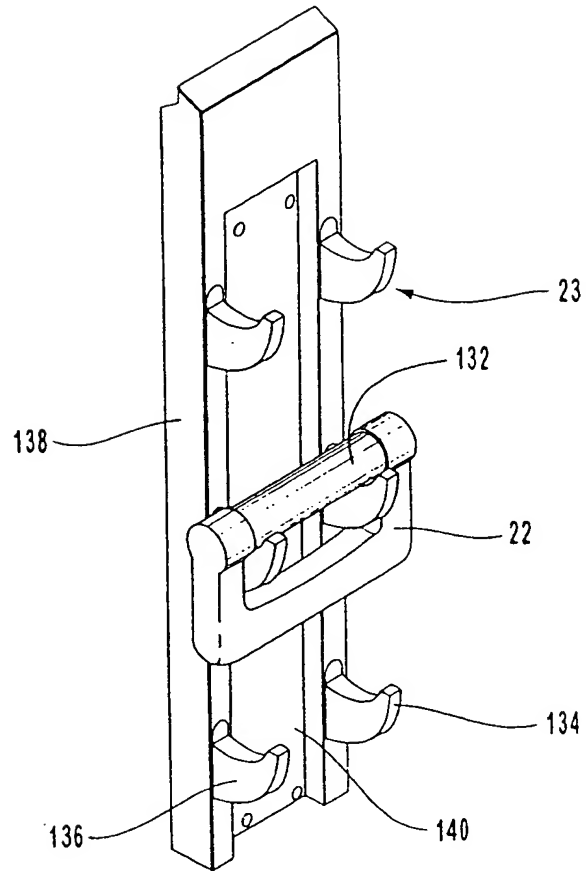


FIG. 5

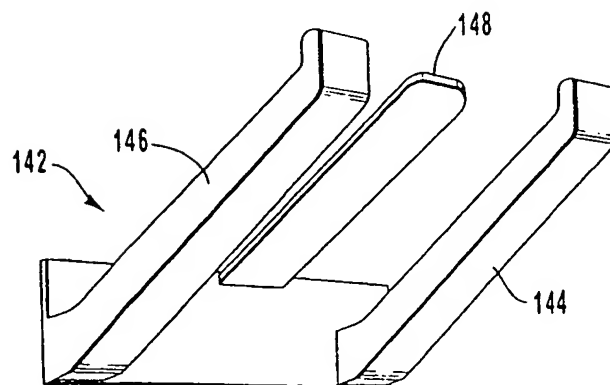


FIG. 6

6 / 16

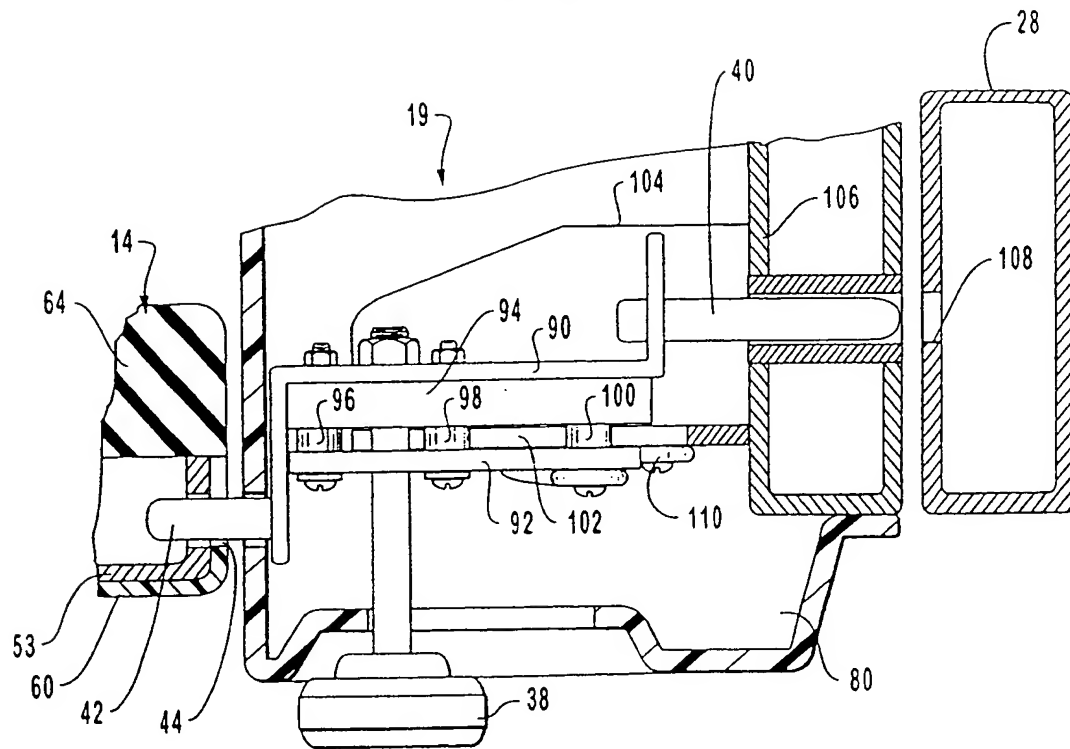


FIG. 7

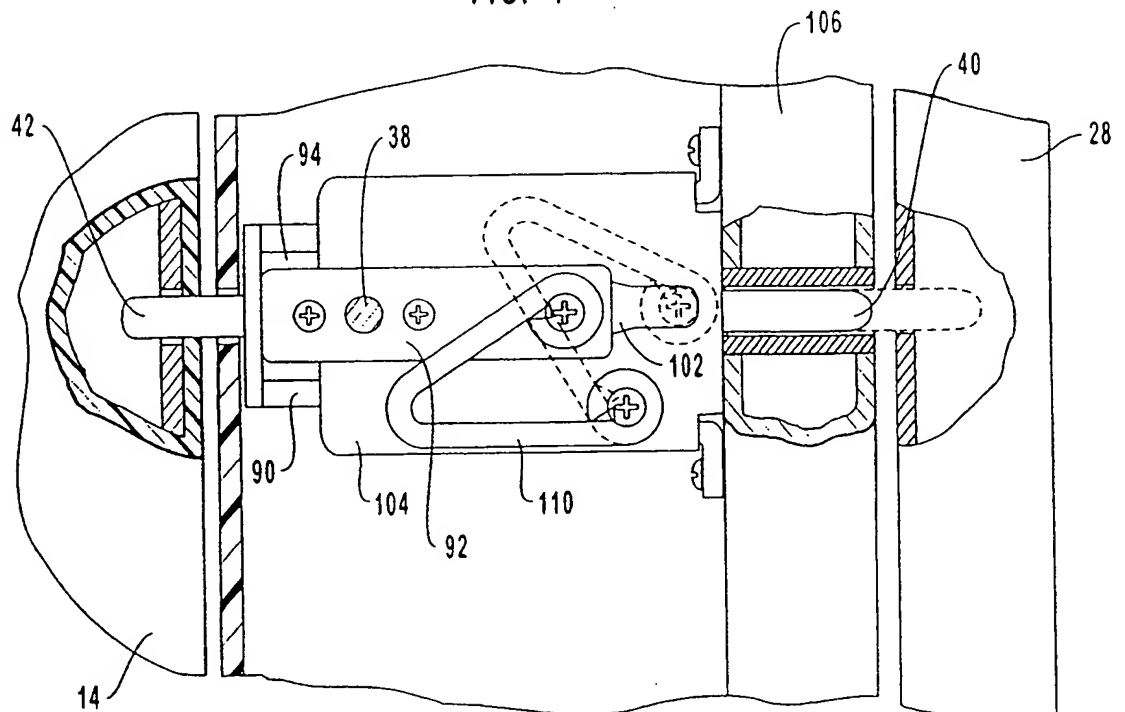


FIG. 8

7 / 16

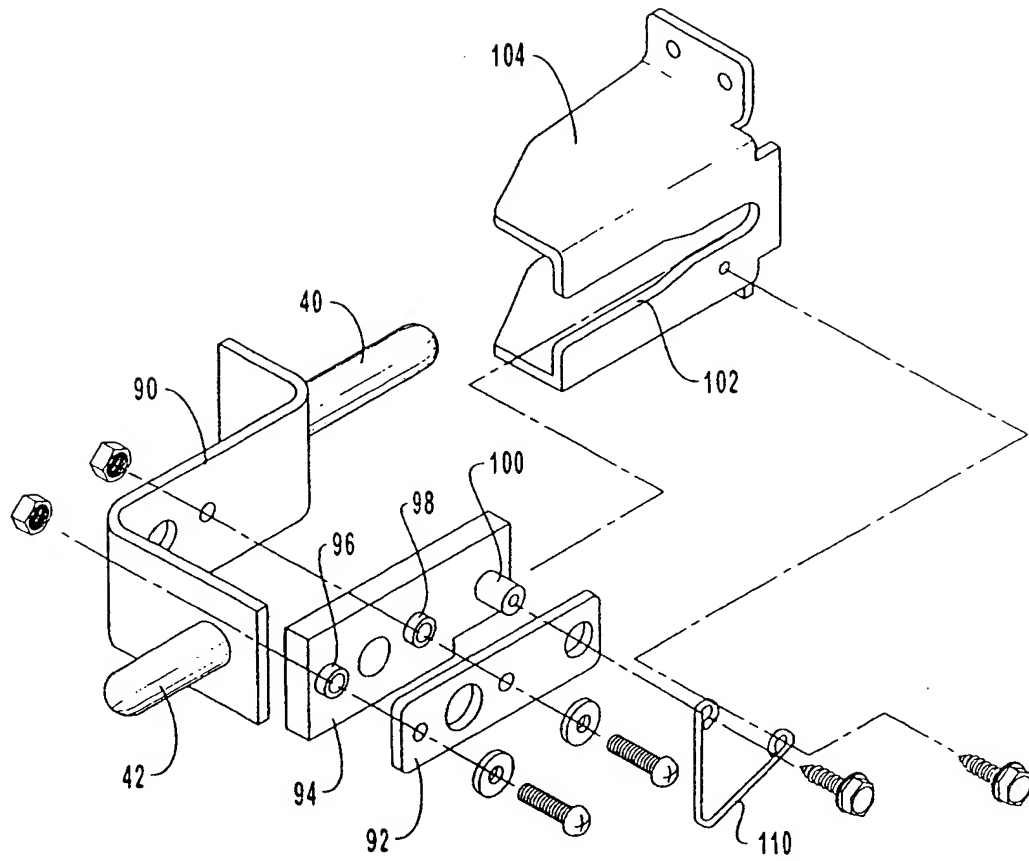


FIG. 9

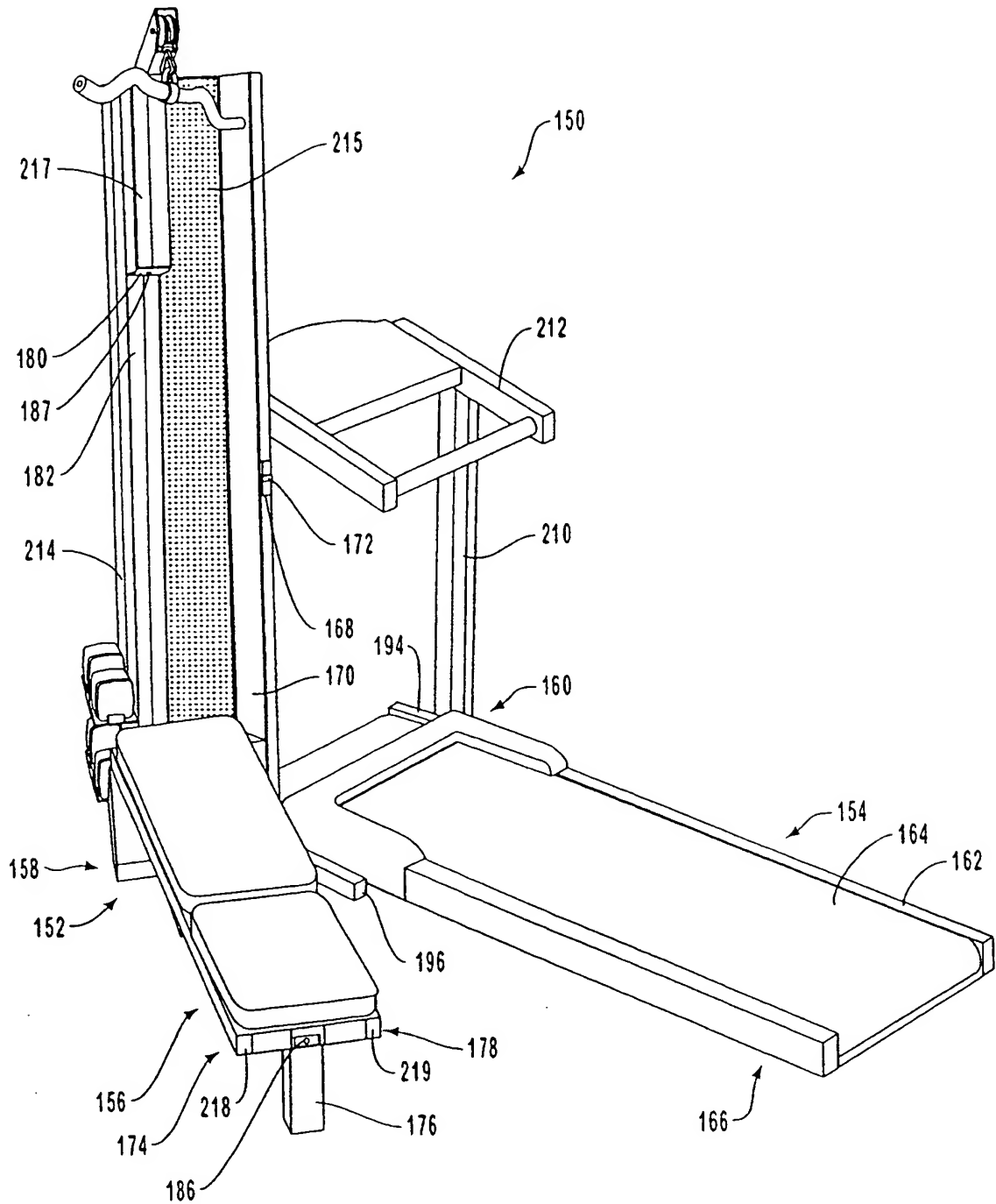


FIG. 10

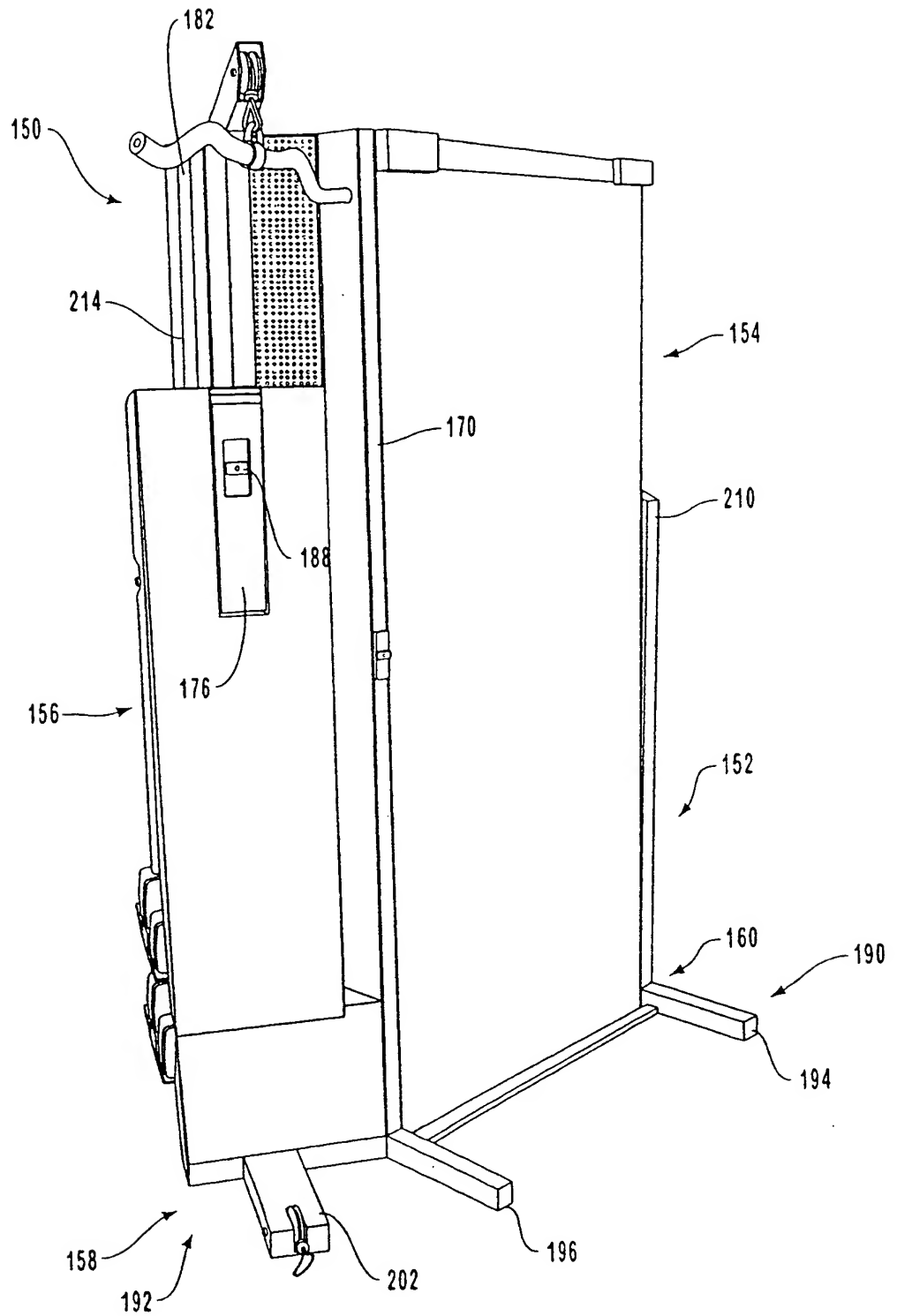


FIG. 11

10 / 16

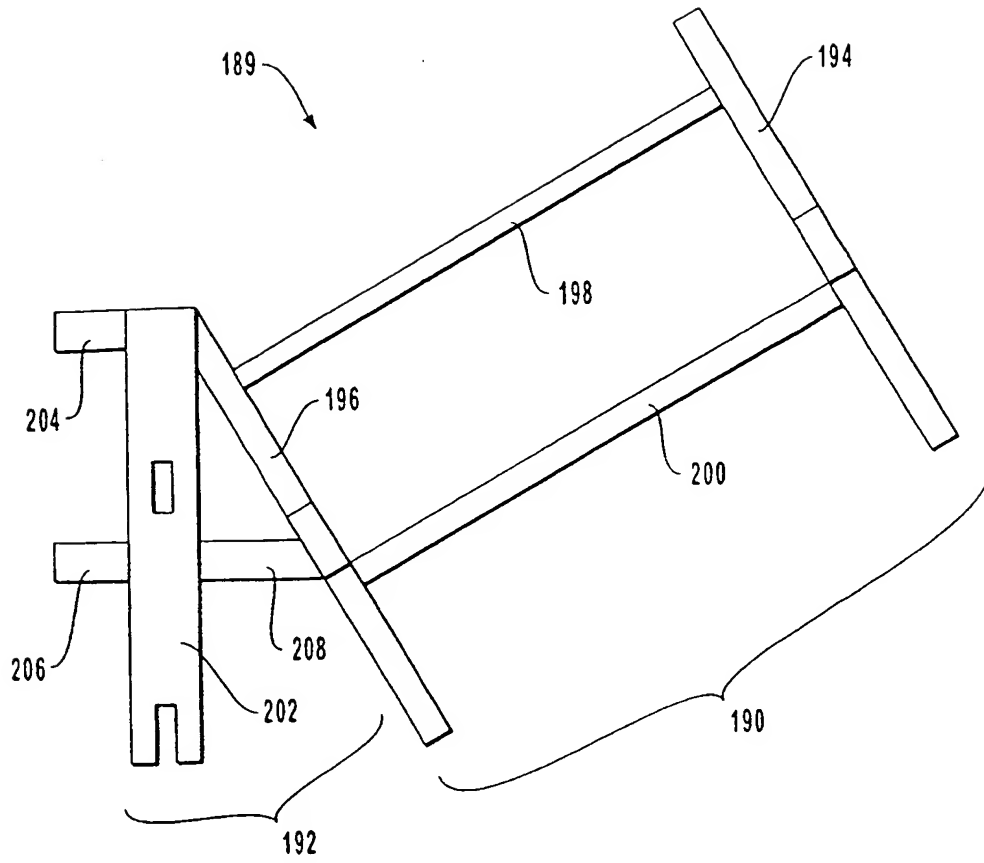


FIG. 12

11 / 16

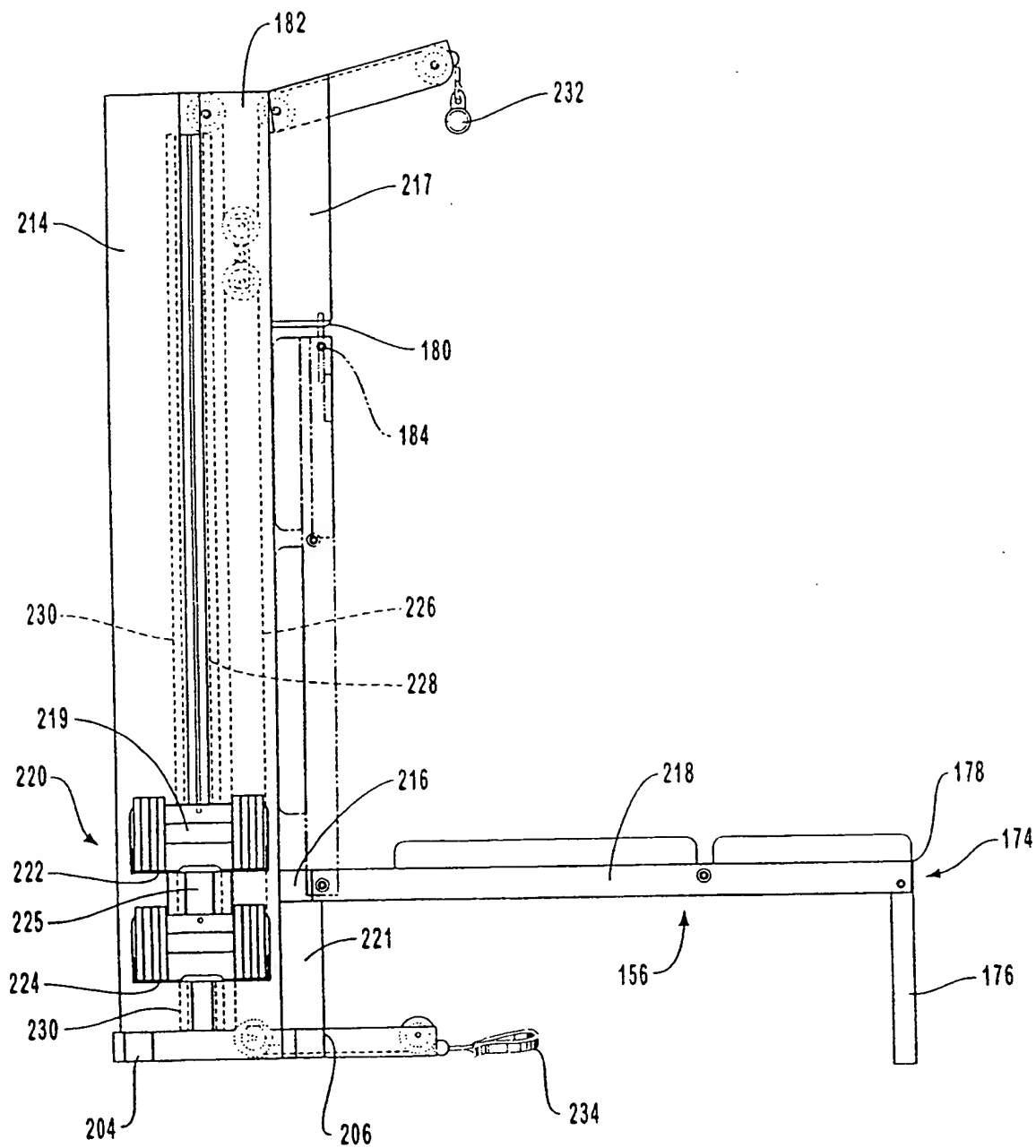


FIG. 13

12 / 16

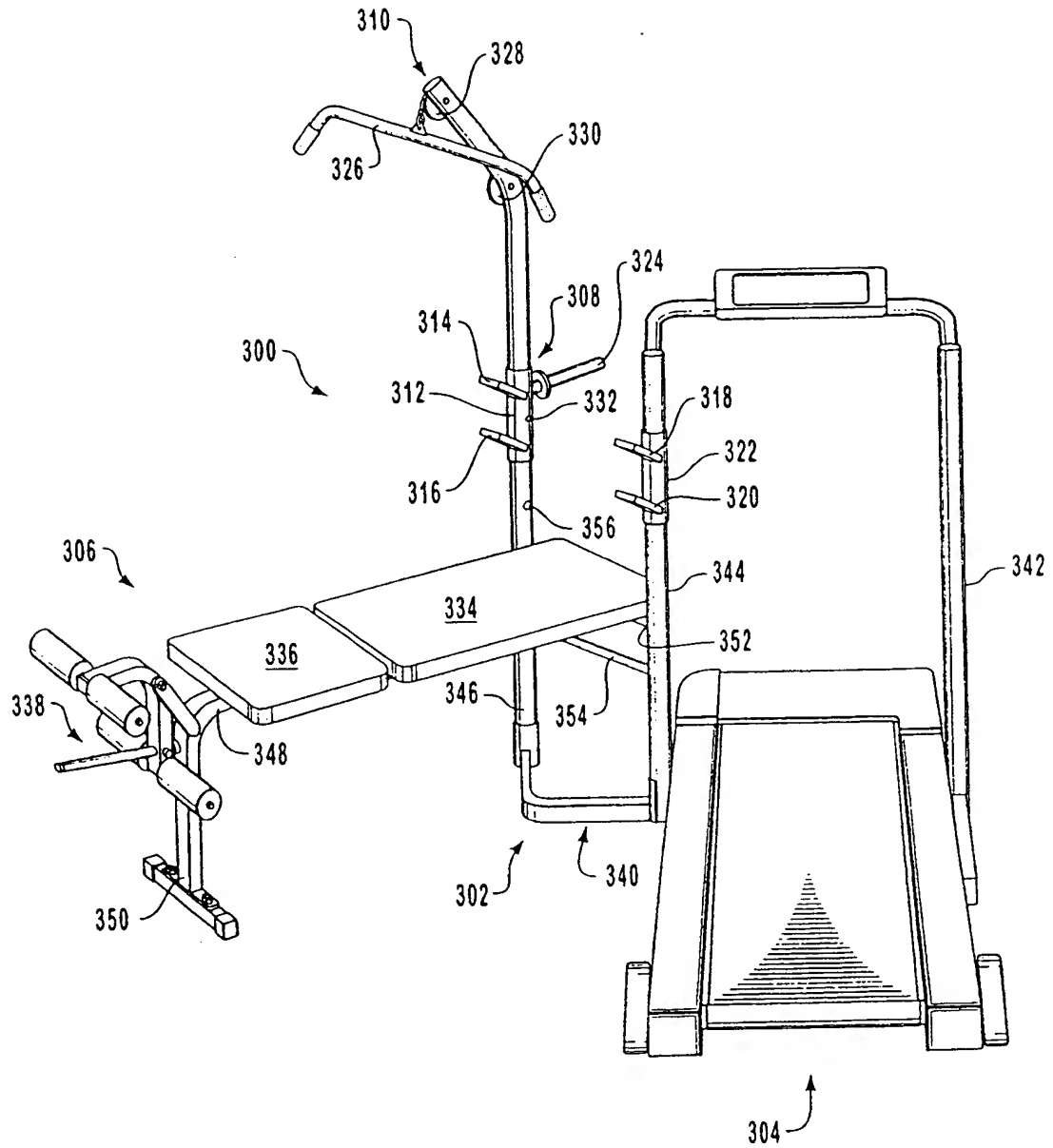


FIG. 14

13 / 16

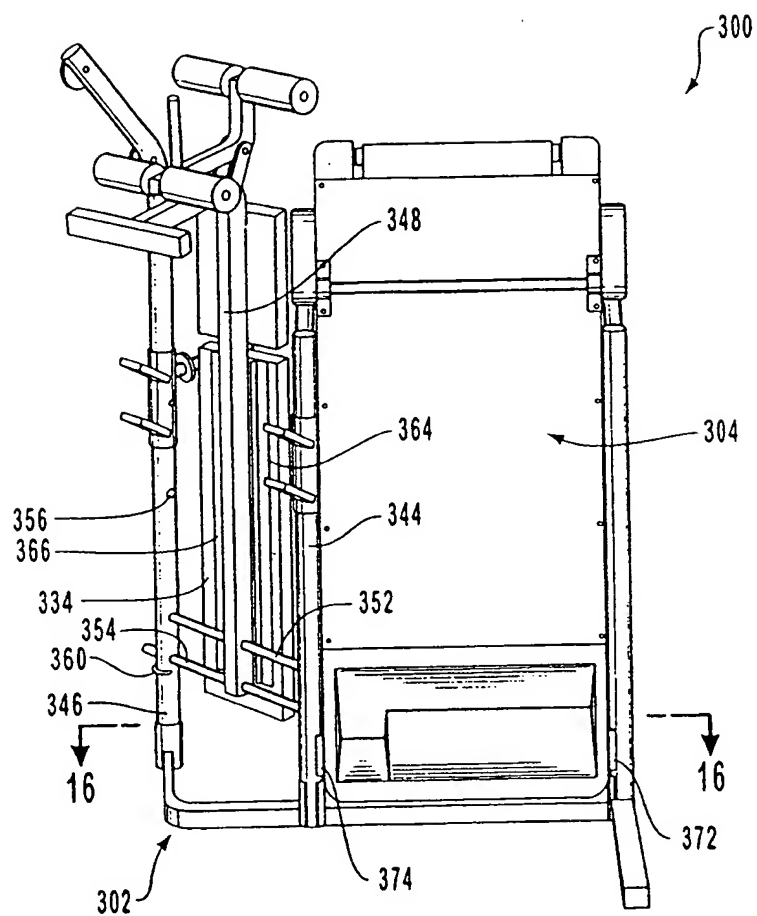


FIG. 15

14 / 16

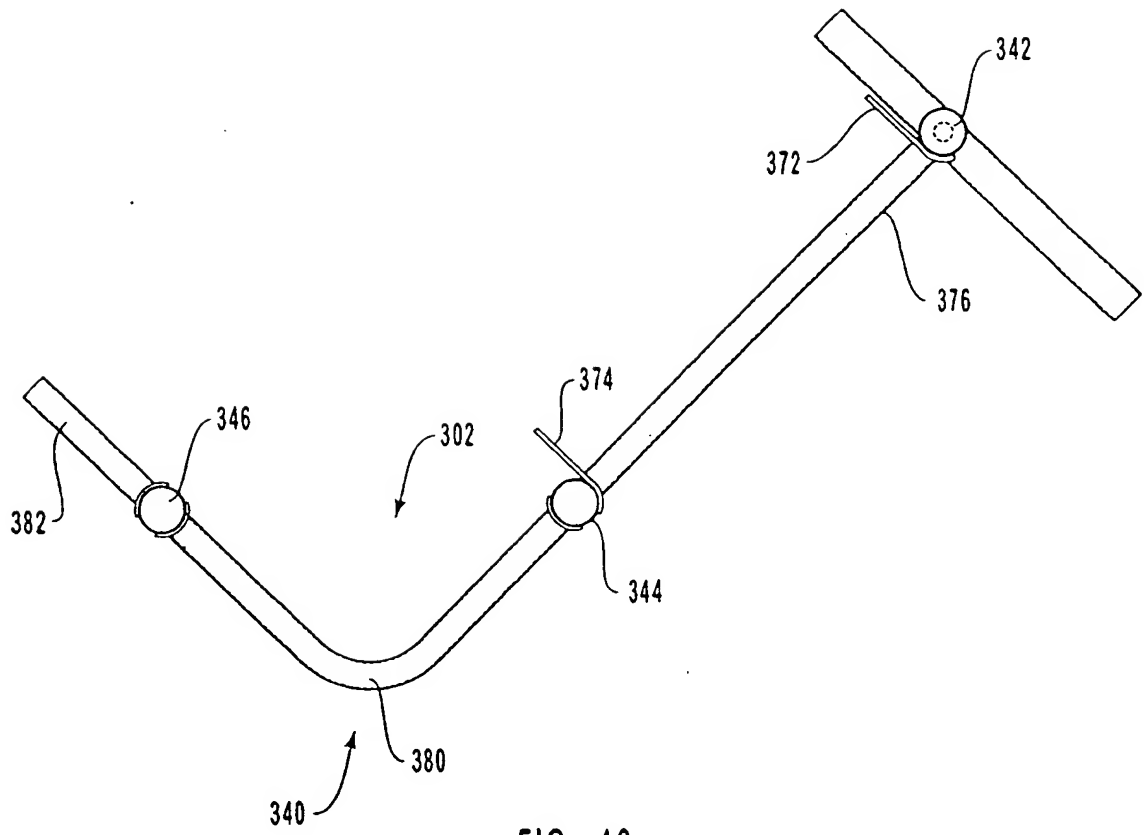


FIG. 16

15 / 16

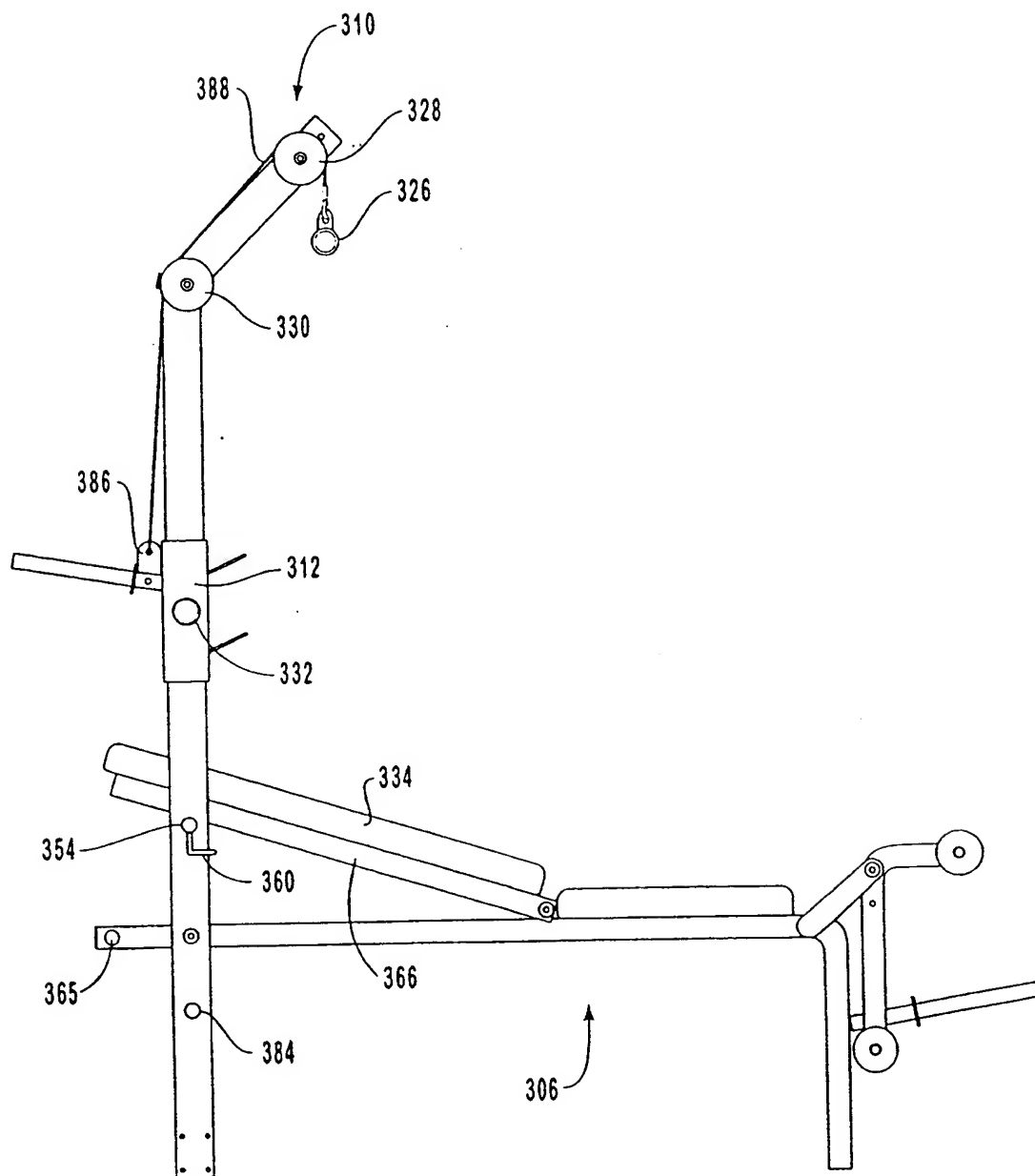


FIG. 17

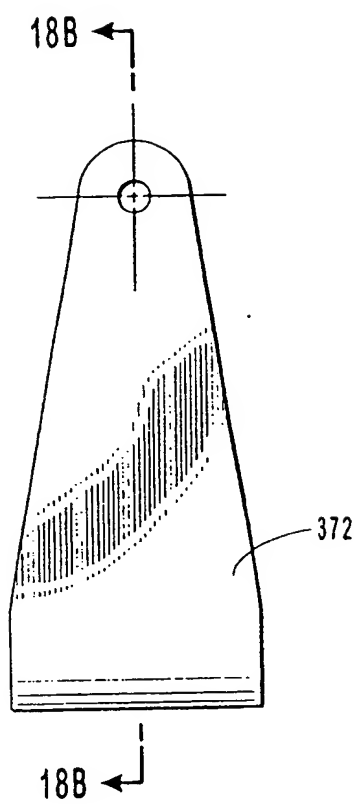


FIG. 18A

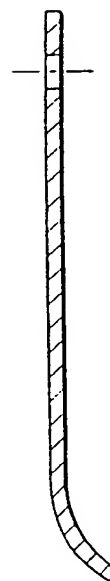


FIG. 18B

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US99/24446

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : A63B 21/00

US CL : 482/54

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 482/54

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,733,228 A (STEVENS) 31 March 1998, entire document.	1-26
Y,P	^{US} 5,868,648 A (COODY et al.) 09 February 1999, entire document.	1-26

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

02 DECEMBER 1999

Date of mailing of the international search report

19 JAN 2000

Name and mailing address of the ISA-US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231Authorized officer
GLENN RICHMAN

Facsimile No. (703) 306-4520

Telephone No. (703) 308-2170

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.